

BURNPUR RIVERSIDE SCHOOL, CHITTARANJAN
PERIODIC TEST I: (2025-2026)
PHYSICAL EDUCATION
CLASS: XII

Time : 1½ Hours

Maximum Marks : 40

NAME: _____ SEC.: _____ ROLL NO.: _____

General Instructions :

- (i) The question paper consists of 5 sections and 20 questions.
(ii) **Section - A** consists of question 1- 7 carrying 1 mark each and is multiple choice questions. All questions are compulsory.
(iii) **Section - B** consists of question 8-11 carrying 2 marks each and are Very short Answer Types and should not exceed 60-90 words. Attempt any 3.
(iv) **Section - C** consists of question 12- 15 carrying 3 marks each and are Short Answer Types and should not exceed 100-150 words. **Attempt any 3.**
(v) **Section - D** consists of question 16-17 carrying 4 marks each and are case studies. There is internal choice available.
(vi) **Section - E** consists of question 18-20 carrying 5 marks each and are Long Answer Types and should not exceed 200-300 words. Attempt any 2.

SECTION A**(All Questions are Compulsory)**

1. What is the formula to determine number of matches in League fixture for even number of teams? 1
(a) $N+1/2$ (b) $N-1/2$ (c) $N(N-1)/2$ (d) $N(N+1)/2$
2. The fourth bye is given to the _____ team of upper half in knock-out tournament. 1
(a) first (b) last (c) middle (d) anywhere
3. In bow - legs, there is 1
(a) Knees colliding with each other (b) Wide gap between the knees
(c) Plain foot sole (d) Both legs curving inwards
4. If the menstruation cycle does not begin at puberty, the condition is called _____ 1
(a) Primary amenorrhea (b) Secondary amenorrhea
(c) Oligo menorrhea (d) Dysmenorrhea
5. Which of the following is not a yoga pose for treatment of diabetes? 1
(a) Tadasana (b) Bhujangasana
(c) Pawanmuktasana (d) ArdhaMatsyendrasana
6. The first Deaflympics were held in 1
(a) 1920 (b) 1924 (c) 1928 (d) 1932
7. Who started Special Olympics? 1
(a) Eunice Kennedy Shriver (b) John F. Kennedy (c) Cassidy (d) Brian Tracy

SECTION- B**(Attempt any 3 questions)**

8. State two contraindications of Tadasana. 1+1
9. What do you Understand by Bulimia Nervosa? 2
10. What is bye? How many byes will be given for 21 teams in a knock -out tournament in which 4 teams are to be given special seeding? 1+1
11. Differentiate between Paralympic and Special Olympics games. 1+1

SECTION- C**(Attempt any 3 questions)**

12. Write in brief the corrective measures of Bow Leg, knock knee and Flat foot. 1+1+1
13. What do you mean by Intramural and Extramural competition? Explain. 1.5+1.5
14. How Yoga helps in asthma and hypertension problem? 3
15. Write a short note on Deaflympics. 3

SECTION-D

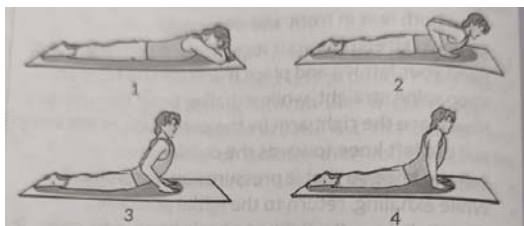
(Internal Choices available)

16. ABC School is one of the reputed schools in their location for the number of sports facilities it provides to its stakeholders. Keeping that in consideration CBSE Sports cell has given them the responsibility of conducting CBSE Football cluster, 35 teams have sent their entry for participation in the tournament. 1×4
- a) Due to large number of teams willing to participate, the school is conducting the competition by _____ fixture.
- b) Total number of rounds will be _____ .
- c) Total number of byes in lower half will be _____ .
- d) Total number of matches will be _____ .

OR

The formula for calculating number of byes in upper half and lower half are..... respectively.

17. 1×4
- Mr.Luthra aged 50 years is recommended to practice the below asana as a therapeutic measure. He is a software engineer by occupation and spends lot of time sitting at one place. He developed certain symptoms like frequent urge for urination,tiredness, excessive weight gain along with being anxious and gets easily irritated.



- i) From the shape of the body in the given pose , identify the asana.
- ii) Mr.Luthra is diagnosed with _____.
- iii) Blood sugar levels are controlled by which hormone?
- iv) Which asana do you think Mr.Luthra should do?

SECTION-E

(Attempt any 2 questions)

18. Discuss the physical, social and psychological benefits of sports participation of women in detail. 5
19. What is inclusion? Discuss the need of inclusion in sports. 1+4
20. What is the meaning of Tournament? Draw a knock-out fixture for 27 teams. 5

BURNPUR RIVERSIDE SCHOOL, CHITTARANJAN
PERIODIC TEST I : (2025-2026)
ACCOUNTANCY
CLASS: XII

Time: 1½ Hours

Maximum Marks: 40

NAME: _____ SEC.: _____ ROLL NO.: _____

General Instructions:

(i) This paper has 18 questions. All questions are compulsory

(ii) Marks are indicated against each question.

(iii) Question 1-11 carry 1 mark.

(iv) Question 12-14 carry 3 marks.

(v) Question 15-16 carry 4 marks.

(vi) Question 17-18 carry 6 marks.

(v) Attempt all parts of the questions together.

1. The relation of partner with the firm is that of : 1
a) An Owner b) An agent c) An owner and agent d) Manager
2. When Goodwill is not purchased, goodwill account can: 1
a) Never be raised in the books.
b) Be raised in the books.
c) Be partially raised in the books.
d) Be raised as per the agreement of the partners.

OR

The excess amount on which the firm can get on selling its assets over and above the saleable value of its assets is called:

- a) Surplus b) Super Profit c) Reserve d) Goodwill
3. A and B are partners sharing profit in the ratio of 3:2. They admit C as a partner by giving him 1/3 share in future profits. The new ratio will be : 1
a) 12:8:5 b) 8:12:5 c) 5:5:12 d) None of these
4. Match the following and choose the correct option: 1

Column A**Column B**

- | | | |
|---------------------------------|-----------------------------|--|
| i) Interest on Capital | A) Cr. Side of P/L App. A/C | |
| ii) Interest on Drawing | B) Dr. Side of P/L App. A/C | |
| iii) Interest on Partner's Loan | C) Dr. Side of P/L A/C | |
| a) (i)-A, (ii)-C, (iii)-B | b) (i)-C, (ii)-B, (iii)-A | |
| c) (i)-B, (ii)-A, (iii)-C | d) (i)-B, (ii)-C, (iii)-A | |
5. Partnership is also called _____ 1
a) Prospectus b) Articles of Association
c) Principals of Partnership d) Articles of Partnership

OR

In case of partnership the act of any partner is:

- a) Binding on all partners.

- b) Binding on that partner only.
 c) Binding on all partner except that particular partner.
 d) None of the above.
6. **Assertion (A):** Change in profit sharing ratio leads to dissolution of the partnership and not the firm. 1
Reason (R): Change in profit sharing ratio leads to dissolution of the old firm and a new firm comes into existence.
 a) Both **(A)** and **(R)** are correct and **(R)** is the correct reason of **(A)**.
 b) Both **(A)** and **(R)** are correct and **(R)** is not the correct reason of **(A)**.
 c) Only **(A)** is correct.
 d) Both **(A)** and **(R)** are wrong.
7. X and Y are partners in a firm with capitals ₹18000 and ₹20000. Z brings ₹20000 for his share of goodwill and he is required to bring proportionate capital for 1/3rd share in profits. The capital contribution of Z will be: 1
 a) ₹24000 b) ₹19000 c) ₹12667 d) ₹14000
- OR**
- C,D and E were partners in a firm sharing profits and losses in the ratio of 5:3:2. They admitted F as a new partner for 1/4th share in the profits which was sacrificed by C,D and E in the ratio of 2:1:2. C's new share in the profit will be:
 a) 2/5 b) 3/5 c) 3/10 d) 4/20
8. In absence of partnership deed, the allowable rate of interest on the partners loan account will be : 1
 a) 6% simple interest b) 6% p.a. Simple Interest
 c) 12% simple interest d) 12% compounded annually
9. A,B and C were partners sharing profits or losses in the ratio of 7:3:2. From Jan 2025, they decided to share the profits or losses in the ratio of 8:4:3. Due to change in the profit and loss sharing ratio. B's gain or sacrifice will be : 1
 a) Gain 1/60 b) Sacrifice 1/60 c) Gain 2/60 d) Sacrifice 3/60
10. **Assertion (A):** If there are eight partners in a firm, a new partner cannot be admitted even if one partner does not agree to this. 1
Reason (R): A new partner can be admitted if majority of partners agree on his admission.
 In context of the above two statements, which one is the correct one.
 a) Both **(A)** and **(R)** are correct and **(R)** correctly explains **(A)**.
 b) Both **(A)** and **(R)** are correct but **(R)** does not explain **(A)**.
 c) Both **(A)** and **(R)** are incorrect.
 d) **(A)** is correct but **(R)** is incorrect.
11. Super profit is equal to _____ less _____ 1
 a) Actual Profit; Normal Profit b) Normal Profit; Actual Profit
 c) Average Profit; Net Assets d) Assets; Outside Liabilities

12. Calculate interest on Krishna's drawings 3
 i) If she has withdrawn ₹40000 during the year and interest on drawing is charged @10% per annum.
 ii) If she has withdrawn ₹40000 during the year and interest on drawing is charged @10%
13. Why are reserves and accumulated profits credited to the partner's capital accounts in case of change in profit sharing ratio amongst the existing partners? 3

OR

A firm's average profit is ₹70000. It includes an abnormal profit of ₹5000. Capital invested in the business is ₹5,50,000 and normal rate of return is 10%.
 Calculate the Super Profit.

14. A, B and C were partner in a firm sharing profits in the ratio of 3:3:2. They admitted D as a new partner for 4/7 profit. D acquired his share 2/7 from A, 1/7 from B and 1/7 from C. Calculate the new profit-sharing ratio. 3
15. From the figures given below, calculate the goodwill according to the Capitalisation of Avg. Profit Method. 4
 i. Actual Average Profit = **₹72,000**
 ii. Normal Rate of Return = **10%**
 iii. Assets = **₹9,70,000**
 iv. Outside Liabilities = **₹4,00,000**
16. A and B are partners in a firm sharing profits and losses in the ratio of 3:2. C is admitted into partnership. A sacrifices 1/3 of his share and B sacrifices 1/10 from his share in favour of C. Determine the sacrificing ratio and the new profit-sharing ratio. 4

OR

A and B are partners sharing profits in the ratio of 4:1. A surrenders 1/4th of his share and B surrenders 1/2 of his share in favour of C, a new partner. What is the sacrificing ratio and the new ratio?

17. A, B, C and D were partners in a firm sharing profits in the ratio of 4:3:2:1. C was guaranteed a profit of **₹2,50,000**. Any deficiency on account of guarantee to C was to be borne by A and B in the ratio of 2:3. The profit of the firm for the year ended 31.03.2024 amounted to **₹10,00,000**. Prepare profit and loss appropriation account of the firm for the year ended on 31.03.2025. 6

OR

The partners of a firm distributed the profits for the year ended 31st March 2024, **₹90,000** in the ratio of 3:2 without providing for the following adjustments:

- (i) A and B were entitled to a salary of **₹1,500** each per annum.
 (ii) B was entitled to a commission of **₹4,500**.
 (iii) B and C has guaranteed a minimum profit of **₹35,000** p.a. to A.
 (iv) Profits were to be shared in the ratio of 3:3:2.

Pass the necessary journal entry for the above adjustments in the books of the firm.

18. X,Y and Z are partners sharing profit and losses in the ratio of 2:2:1. From 1st April 2023 6
they decided to share future profits and losses equally.

Following balances appeared in their books:

	₹
Profit and Loss A/C (Cr.)	20,000
Advertisement Suspense A/C (Dr.)	15,000
Workmen Compensation Reserve	60,000

It was agreed that :

- (i) Goodwill should be valued at two years purchase of super profits. Firms average profit is **₹75,000**. Capital invested in the business is **₹6,00,000** and normal rate of return is **10%**.
- (ii) Furniture (book value of **₹50,000**) be reduced to **₹30,000**.
- (iii) Computers (book value of **₹40,000**) be reduced by **₹10,000**.
- (iv) Claim on account of Workmen's Compensation amounted to **₹50,000**.
- (v) Investments (book value of **₹30,000**) were revalued at **₹25,000**.

Pass necessary journal entries for the above.

BURNPUR RIVERSIDE SCHOOL, CHITTARANJAN
PERIODIC TEST I: (2025-2026)
BIOLOGY
CLASS: XII

Time: 1½ Hours

Maximum Marks: 40

NAME: _____ SEC.: _____ ROLL NO.: _____

General Instruction:

- (i) All questions are compulsory.
- (ii) The question paper has five sections and 20 questions.
- (iii) Section–A has 10 questions of 1 mark each; Section–B has 3 questions of 2 marks each; Section– C has 5 questions of 3 marks each; Section– D has 1 case-based question of 4 marks; and Section–E has 1 question of 5 marks.
- (iv) There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
- (v) Wherever necessary, neat and properly labelled diagrams should be drawn

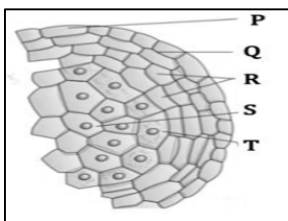
SECTION - A

1. Signals for parturition in human female originate from 1
 A) Fully developed foetus only B) Both placenta as well as fully developed foetus
 C) Placenta only D) Oxytocin released from maternal pituitary
2. 10 Oogonia yield 10 primary oocytes, then how many ova are produced on completion of Oogenesis? 1
 A) 5 B) 10 C) 20 D) 40
3. Which among the following came into India as a contaminant with imported wheat, has become ubiquitous in occurrence and causes pollen allergy? 1
 A) *Lantana* B) *Eicchhornia* C) *Parthenium* D) *Chenopodium*
4. Spermiation is the process of the release of sperms from 1
 A) Seminiferous tubules B) Vas deferens C) Epididymis D) Prostate gland
5. What is the ploidy of megaspore mother cell, functional megaspore, and endosperm- 1
 A) 2n,n,n B) n,n,n C) 2n,n,3n D) 2n,3n,3n
6. Consider the statements given below regarding contraception and answer as directed thereafter- 1
 I. Medical Termination of Pregnancy (MTP) during first trimester is generally safe.
 II. Generally chances of conception are nil until mother breast feeds the infant up to two years.
 III. Intrauterine devices like Copper T are effective contraceptives
 IV. Contraception pills may be taken up to one week after coitus to prevent conception.
 Which two of the above statements are correct?
 A) III, IV B) I, III C) I, II D) II, III
7. If a genetic disease is transferred from a phenotypically normal but carrier female to only some of the male progeny, the disease is: 1
 A) Autosomal dominant B) Autosomal recessive
 C) Sex- linked dominant D) Sex -linked recessive

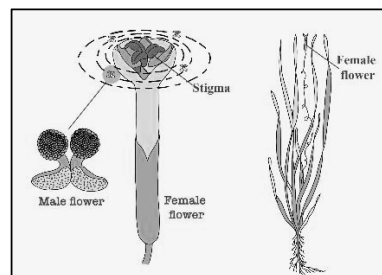
8. Where does fertilization occur in the human body? 1
 A) Ovary B) Uterus C) Fallopian tube D) Vagina
- In following questions (Q. No 9,10) a statement of **ASSERTION** followed by a statement of **REASON** is given. Choose the correct answer out of the following choices.
- A) **Assertion** and **reason** both are correct statements and reason is correct explanation for assertion.
- B) **Assertion** and **reason** both are correct statements but reason is not correct explanation for assertion.
- C) **Assertion** is correct statement but **reason** is wrong statement.
- D) **Assertion** is wrong statement but **reason** is correct statement.
9. **Assertion:** "Saheli" is an oral contraceptive pill for females containing nonsteroidal preparation. 1
Reason: It is "once in a week" pill with high contraceptive value and less side effects.
10. **Assertion:** The testes are situated outside the abdominal cavity within the scrotum (extra abdominal cavity). 1
Reason: Muscles in scrotum helps to maintain low temperature of testes, necessary for spermatogenesis.

SECTION B

11. Given below is an enlarged view of one microsporangium of a mature anther. 2
 i) Identify and name R & S wall layers.
 ii) Mention the characteristics and function of the cell forming wall layer "T".

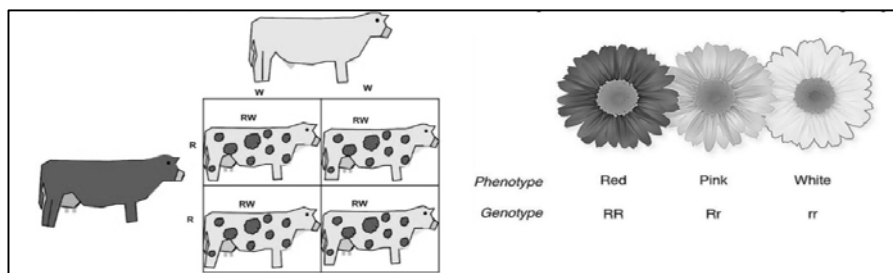


12. Identify the type of pollination and the plant species. 2
 State two peculiarities of pollination of following plant.



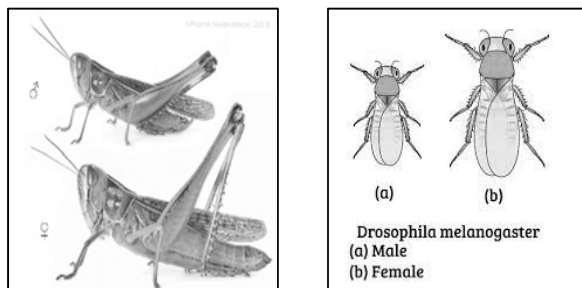
13. Attempt either option A or B.

- A. Describe the following two types of genetic expression with proper examples.



OR

- B. Why are following organisms said to show male heterogamety? Explain.



SECTION - C

14. Attempt either option A or B.

- A. Compare between geitonogamy and xenogamy on four points. Why do cleistogamous flower always assure seed formation? 3

OR

- B. Compare apomixis and polyembryony. Write one contrasting point between pericarp and perisperm.

15. A true breeding Pea plant homozygous for axial violet flowers(AAVV) is crossed with another Pea plant with terminal white flowers (aavv). 3

- (a) What would be the phenotype of F1 and F2 generation and genotypic ratio of F2 generation?
(b) List the Mendel's generalisations which can be derived from the above cross.

16. Summarize the importance of T.H. Morgan's experiment on the following point. 3

- Deviation of results of (dihybrid cross) fruit fly's experiment from the expected ratio of Mendel's dihybrid cross.

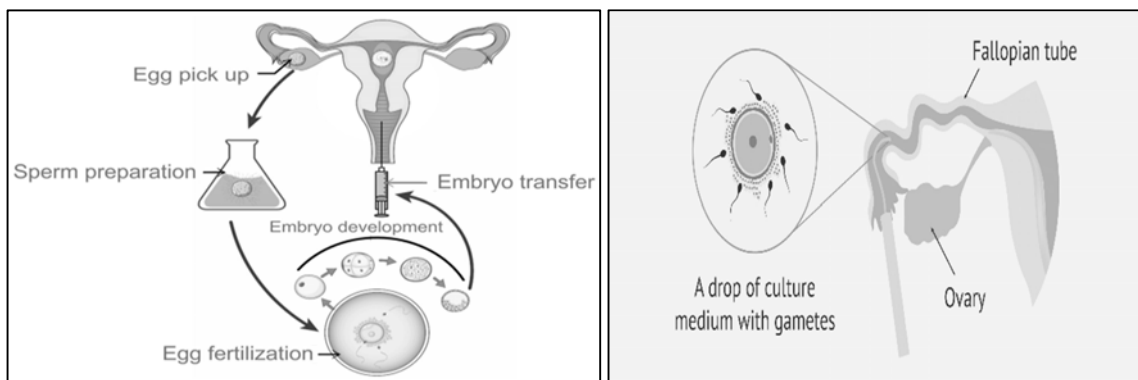
Attempt either option A or B.

17. A. Justify that Placenta and granulosa cells of secondary oocyte act as endocrine tissues. What is morula? 3

OR

- B. Outline the events which make polyspermy as an impossible event in fertilization process. What is oestrous cycle?

18. (a) Compare two methods of assisted reproductive technique in the following two diagrams. 3
(b) List four different chemical methods of contraception in women.



SECTION – D

19. **Read the below passage and answer the following questions.** 4

Intrauterine devices are most widely accepted methods of contraception. These are used by females and are inserted by doctor or nurses in the uterus through vagina. However these devices are not recommended for those who eventually intend to conceive.

- (i) How does CuT prevent conception?

Attempt either option (ii) or (iii).

- (ii) What do you think is the significance of reproductive health in a society?

OR

- (iii) Amniocentesis for sex determination is banned in our country. Mention its significance.

- (iv) Which contraceptive method is also help to prevent STDs?

SECTION - E

20. Attempt either option A or B. 5

- A. Describe the uterine and ovarian changes occur during different phases of menstrual cycle with proper diagram.

OR

B.

- (i) How is oogenesis markedly different from spermatogenesis with respect to growth till puberty?

- (ii) Name and explain the role of the inner and middle walls of the human uterus during implantation.

BURNPUR RIVERSIDE SCHOOL, CHITTARANJAN
PERIODIC TEST I: (2025-26)
BUSINESS STUDIES
CLASS: XII

Time: 1 ½ Hours

Maximum Marks:40

Name: _____ Sec.: _____ Roll No.: _____

General Instructions:

- (i) This paper has 17 questions. All questions are compulsory.
- (ii) Marks are indicated against each question.
- (iii) Answer should be brief and to the point.
- (iv) Answer to the questions carrying 3 marks may be from 50-75 words.
- (v) Answer to the questions carrying 4 marks may be about 150 words.
- (vi) Answer to the questions carrying 6 marks may be about 200 words.
- (vii) Attempt all parts of the questions together.

1. Abhi works as a production manager in 'Elegant Enterprises' manufacturing LED lights. Due to Festive season, there is a lot of demand for their lights. Abhi was given the task of producing 100 units of LED lights @₹200 per unit within 5 days for an urgent order. Abhi was able to achieve the target of 100 units of LED lights within 5 days @₹220 per unit. Identify from the following, whether Abhi is : 1
 - a) Efficient only b) Effective only
 - c) Both Efficient and Effective d) Neither Effective nor Efficient
2. Violation of this principle will create insecurity among the employees. This statement is related to: 1
 - a) Esprit De Corps b) Remuneration c) Stability of Personnel d) Authority & Responsibility

OR

Right Place for resource is indicated in –

 - a) Principle of Order b) Principle of Equity
 - c) Principle of fair remuneration d) Principle of Discipline
3. **Statement I:** Business environment helps in coping up with rapid changes. 1
Statement II: Nowadays retailers have direct link with suppliers who replenish stocks when needed.
 - a) Both the statements are true.
 - b) Both the statements are false.
 - c) Statement I is true and Statement II is false.
 - d) Statement I is false and Statement II is true.
4. "Management is what management does." 1
Which feature is referred from the above statement?
 - a) Intangible Force b) Goal Oriented c) Futuristic d) Continuous

OR

Which level of management is responsible for the welfare and survival of the organisation?

 - a) Top Level of Management b) Middle Level Management
 - c) Supervisory Level d) Both (b) and (c)
5. Identify the dimensions of business environment illustrated in the picture 1



- a) Technological and Social b) Technological and Political
- c) Political and Economic d) Social and Legal

6. **Assertion (A)** : The principles of management have universal applicability
Reason (R) : The principles of management are applicable in all types and sizes of organisations 1
- a) Both **(A)** and **(R)** are correct and **(R)** is the correct reason of **(A)**.
b) Both **(A)** and **(R)** are correct and **(R)** is not the correct reason of **(A)**.
c) **(A)** is true but **(R)** is false
d) **(A)** is false but **(R)** is true
7. Aiming to revive Jammu & Kashmir attraction as a top location for film shooting, the Jammu & Kashmir film policy, 2021 offers a host of incentives to the film makers, such as subsidies and low long-term interest rates, for films with patriotic and certain other themes shoot in Jammu & Kashmir, for giving work opportunities to local artists etc. This will have an impact on the business enterprises in the state. Which component of business environment is highlighted above? 1
- a) Specific and General Forces
b) Technological Environment
c) Economic Environment
d) Political Environment
8. Principles of management have been developed on the basis of _____. 1
- a) Observation
b) Experimentation
c) Personal Experience of the Manager
d) mainly behavioural
- OR
- The principles of pure science are considered to be _____ in nature.
a) Flexible
b) Rigid
c) Creative
d) contingent
9. Match the following and choose the correct option: 1
- | Column A | Column B |
|----------------------------|---|
| A) Effectiveness | i) doing the task correctly with minimum cost |
| B) Efficiency | ii) finishing the task on time |
| C) Process | iii) The primary function or activities that management performs to get |
| a) A-(i), B-(ii), C-(iii) | b) A-(ii), B-(i), C-(iii) |
| c) A-(iii), B-(ii), C-(ii) | d) A-(i), B-(iii), C-(ii) |
10. A worker directly contacts the CEO of the company with a complain regarding working conditions in the factory. Which of the following principles is being violated here? 1
- a) Unity of command
b) Discipline
c) Scalar Chain
d) Unity of Direction
11. Mr. Rajiv is the owner of Laxmi Dairy. He is producing various milk products and chooses the best and most economical way of production. He is also very particular about fixing a place for everything and he makes sure that all the employees are given a fixed place so there is no wastage of time and delay in production. 3
- a) Which technique of scientific management is applied by Mr. Rajiv? Explain it.
b) Which principle of Henry Fayol is followed by him?
12. Explain any three features of Business Environment. 3
- OR
- Explain any three features of Demonetization.
13. What is meant by management? Explain its any three feature that established it as an art. 4
- OR
- Describe any four characteristics of coordination.
14. A recent rate cut in the interest on loans announced by Banks encouraged Amit, a science student of Pioneer School to take a loan from SBI to experiment and develop cars to be powered by fuels produced from garbage. He developed such a car and exhibited it in the science fair organised by Directorate of education. He was awarded first prize for his invention. Identify and explain the dimensions of business environment discussed in the above case. 4
15. Explain the following :- 4
- i) Principles of Scalar Chain
ii) Principles of Equity
16. A manager should have the right to punish a subordinate for wilfully not obeying a legitimate order but only after sufficient opportunity has been given to his/her case. 6
- Identify and explain the principles of management highlighted here.
17. "A successful enterprise has to achieve its goal effectively and efficiently". Explain 6
- OR
- "Management is a complex activity that has three main dimensions".
Explain the three dimensions.

BURNPUR RIVERSIDE SCHOOL, CHITTARANJAN
PERIODIC TEST I: (2025-2026)
CHEMISTRY
CLASS: XII

Time: $1\frac{1}{2}$ Hours

Maximum Marks: 40

NAME: _____ SEC.: _____ ROLL NO.: _____

General Instructions:

Read the following instructions very carefully and strictly follow them:

1. There are **18** questions in this question paper with internal choice.
2. **SECTION A** consists of 8 multiple-choice questions carrying **1** mark each.
3. **SECTION B** consists of 3 very short answer questions carrying **2** marks each.
4. **SECTION C** consists of 4 short answer questions carrying **3** marks each.
5. **SECTION D** consists of 1 case-based question carrying **4** marks.
6. **SECTION E** consists of 2 long answer questions carrying **5** marks each.
7. **All questions are compulsory.**
8. **Use of log tables and calculators is not allowed.**

SECTION A*Questions no. 1 to 8 are Multiple Choice type Questions, carrying 1 mark each.*

1. Which of the following solutions will have the highest boiling point in water? [1]
 a) 1% KCl b) 1% glucose c) 1% urea d) 1% CaCl₂
2. During electrolysis of dilute H₂SO₄, using platinum electrodes, the gas evolved at the anode is: [1]
 a) H₂ gas b) O₂ gas c) SO₂ gas d) SO₃ gas
3. Unit of rate constant 'k' for a second order reaction is [1]
 a) s⁻¹ b) mol L⁻¹ s⁻¹ c) mol⁻¹ L s⁻¹ d) mol⁻² L s⁻¹
4. A conductivity cell usually consists of two: [1]
 a) Copper electrodes b) Platinum electrodes c) Zinc electrodes d) Iron electrodes
5. Which of the following is the slope of the first order reaction in the plot of ln[R] vs. time? [1]
 a) + k b) $\frac{+k}{2.303}$ c) -k d) $\frac{-k}{2.303}$
6. Kohlrausch gave the following relation for strong electrolytes: [1]

$$\Lambda_m = \Lambda_m^0 - A\sqrt{C}$$

Which of the following equality holds true?

- | | |
|--|--|
| a) $\Lambda_m = \Lambda_m^0$ as $C \rightarrow 1$ | b) $\Lambda_m = \Lambda_m^0$ as $C \rightarrow 0$ |
| c) $\Lambda_m = \Lambda_m^0$ as $C \rightarrow \infty$ | d) $\Lambda_m = \Lambda_m^0$ as $C \rightarrow \sqrt{A}$ |

For questions No. 7 and 8, two statements are given – one labelled as

Assertion(A) and the other labelled as **Reason(R)**. Select the correct answers to these questions from the code (A), (B), (C) and (D) as given below.

- (A) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of the Assertion (A).
 (B) Both Assertion (A) and Reason (R) are true, but Reason (R) is **not** the correct explanation of the Assertion (A).
 (C) Assertion (A) is true, but Reason (R) is false.
 (D) Assertion (A) is false, but Reason (R) is true.

7. **Assertion (A):** Cooking time is reduced in pressure cooker. [1]
Reason (R): Boiling point of water inside the pressure cooker is lowered down.
 8. **Assertion (A):** Aquatic species are more comfortable in cold water than in warm water. [1]
Reason (R): Solubility of oxygen gas in water decreases with increase in temperature.

SECTION B

9. A. Attempt either option A or B [2]
 (i) P and Q liquids on mixing show rise in temperature. Which type of deviation from Raoult's law is there and why?
 (ii) Why can azeotropic mixture not be separated by fractional distillation?
OR
 B. What type of deviation is shown by chloroform and acetone mixture? Give reason. What type of azeotropic mixture is formed by that deviation?
 10. (i) Can we construct an electrochemical cell with two half cells composed of ZnSO_4 solution and zinc electrodes? Explain your answer. [2]
 (ii) Calculate Λ_m^0 for Cl^- ion from the data given below:
 $\Lambda_m^0 (\text{MgCl}_2) = 258.6 \text{ Scm}^2\text{mol}^{-1}$ and $\Lambda_m^0 (\text{Mg}^{2+}) = 106 \text{ Scm}^2\text{mol}^{-1}$
 11. State a condition under which a bimolecular reaction is kinetically first order reaction. Give an example. For which type of reactions, do order and molecularity have the same value? [2]

SECTION C

12. 0.3 g of acetic acid (Molar mass = 60 g/mol) dissolved in 30 g of benzene shows a depression in freezing point equal to 0.45°C . Calculate the percentage association of acid if it forms a dimer in the solution. [3]
 (Given: K_f for benzene = $5.12 \text{ K Kg mol}^{-1}$)
 13. (i) Define osmotic pressure. [3]
 (ii) At the same temperature, CO_2 gas is more soluble in water than O_2 gas. Which one of them will have higher value of K_H ?
 (iii) What would be the value of van't Hoff factor for a dilute solution of K_2SO_4 assuming that it is completely dissociated.
 14. Attempt either option A or B [3]
 A. Write the name of the cell which is generally used in inverters. Write the reactions taking place at anode and cathode of this cell, when it is in use.

OR

- B. Explain why electrolysis of aqueous solution of NaCl gives H₂ gas at cathode and Cl₂ gas at anode? Write overall reaction.

(Given: $E_{\text{Na}^+/\text{Na}}^0 = -2.71\text{V}$, $E_{\text{H}_2\text{O}/\text{H}_2}^0 = -0.83\text{V}$, $E_{\text{Cl}_2/2\text{Cl}^-}^0 = +1.36\text{V}$, $E_{\text{H}^+/\text{O}_2/\text{H}_2\text{O}}^0 = +1.23\text{V}$)

15. The following data were obtained during the first order thermal decomposition of N₂O₅(g) at constant volume: $2\text{N}_2\text{O}_5(\text{g}) \rightarrow 2\text{N}_2\text{O}_4(\text{g}) + \text{O}_2(\text{g})$ [3]

S.No.	Time(s)	Total Pressure(atm)
1	0	0.5
2	100	0.625

Calculate rate constant. (Given: $\log 2 = 0.3010$, $\log 10 = 1$)

SECTION D

16. Osmosis and osmotic pressure play a significant role in biological processes. The osmotic pressure of human blood is 8.21 atm at 27°C. It is interesting to note that a 0.91% (mass/volume) solution of sodium chloride known as saline water is isotonic with fluids inside the human red blood cells. In this solution, the corpuscles neither swell nor shrink. Therefore, medicines are mixed with saline water before being injected into the veins. [4]

Based on the above passage, answer the following questions:

- What would be the total concentrations of various solutes in the blood?
 - Name the disease caused by taking a lot of salt or salty food.
- Attempt either option iii or iv
- Blood cells are isotonic with 0.9% sodium chloride solution. What happens if we place blood cells in solution containing:
 - 1.2% sodium chloride solution?
 - 0.4% sodium chloride solution?

OR

- How much glucose should be used per 100 ml for intravenous injection that is isotonic with blood?

SECTION E

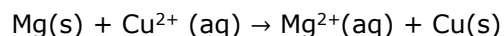
17. Attempt either option A or B [5]

- A.
- Calculate emf of the following cell at 25°C :
 $\text{Zn}(\text{s}) \mid \text{Zn}^{2+} (0.1\text{M}) \parallel \text{H}^+ (0.01\text{M}) \mid \text{H}_2(\text{g}) (1\text{bar}), \text{Pt}(\text{s})$
 (Given: $E_{\text{Zn}^{2+}/\text{Zn}}^0 = -0.76\text{V}$, $E_{\text{H}^+/\text{H}_2}^0 = 0.00\text{V}$, $\log 10 = 1$)
 - State Faraday's second law of electrolysis. How much electricity is required in terms of Faraday for the reduction of 1 mol of Cr₂O₇²⁻ to Cr³⁺?

OR

- B. Answer the following questions:
- The conductivity of 0.20 M solution of KCl is $2.48 \times 10^{-2} \text{ Scm}^{-1}$. Calculate its molar conductivity and degree of dissociation (α).
 (Given: $\lambda_{(\text{K}^+)}^0 = 73.5 \text{ Scm}^2\text{mol}^{-1}$, $\lambda_{(\text{Cl}^-)}^0 = 76.5 \text{ Scm}^2\text{mol}^{-1}$)

- ii) Calculate $\Delta_r G^\circ$ of the following cell:



(Given: $E_{\text{Mg}^{2+}/\text{Mg}}^\circ = -2.37\text{V}$, $E_{\text{Cu}^{2+}/\text{Cu}}^\circ = +0.34\text{V}$, $1\text{F} = 96500\text{ C mol}^{-1}$)

- iii) What type of cell is mercury cell? Why is it more advantageous than dry cell?

18. Attempt either option A or B

[5]

- A.
- i) Show that time required for 99% completion of a first order reaction is twice the time required for the completion of 90% of that reaction.
- ii) A reaction shows first order with respect to A, second order with respect to B and zero order with respect to C. Determine the rate law of the reaction and what will be the rate of reaction on doubling of concentration of A, B and C?

OR

- B.
- i) Rate constant k of a reaction varies with temperature T according to the following Arrhenius equation $\log K = \log A - \frac{E_a}{2.303R} \left(\frac{1}{T}\right)$. Where E_a is the activation energy. When a graph is plotted for $\log k$ vs. $\frac{1}{T}$ a straight line with a slope of -4250 K is obtained. Calculate E_a for the reaction. ($R = 8.314\text{ JK}^{-1}\text{mol}^{-1}$)
- ii) Why is molecularity applicable only for elementary reactions and order is applicable for both elementary as well as complex reactions?

BURNPUR RIVERSIDE SCHOOL, CHITTARANJAN
PERIODIC TEST I: (2025 – 2026)
COMPUTER SCIENCE
CLASS: XII

Time: 1½ Hours

Maximum Marks: 40

NAME: _____ SEC.: _____ ROLL NO.: _____

General Instructions:

- This question paper contains 23 questions.
- All questions are compulsory. However, internal choices have been provided in some questions. Attempt only one of the choices in such questions
- The paper is divided into 5 Sections- A, B, C, D and E.
- Section A, consists of 15 questions (1 to 15). Each question carries 1 Mark
- Section B, consists of 3 questions (16 to 18). Each question carries 2 Marks.
- Section C, consists of 2 questions (19 and 20). Each question carries 3 Marks.
- Section D, consists of 2 questions (21 and 22). Each question carries 4 Marks.
- Section E, consists of 1 question (23). The question carries 5 Marks.
- All programming questions are to be answered using Python Language only.
- In case of MCQ, text of the correct answer should also be written.

SECTION – A (1x15=15 marks)

1. State True or False:

“While defining a function in Python, the positional parameters in the function header must always be written after the default parameters.”

2. What will be the output of the following statement?

>>>print(16*5/4*2/5-8)

- a. -3.33 b. 6.0 c. 0.0 d. 58

3. Identify the invalid Python statement from the following:

- a. d=dict() b. e={ } c. f=[] d. g=dict{ }

4. Identify the correct identifier.

- a. A_12 b. while c. for d. 1AGE

5. Consider the following code fragment, find the correct output of the same from the given options:

s="MISSISSIPPI"

print (s[:4]+"#" +s[-5:])

- a. MISSI#SIPPI b. MISS#SIPPI c. MISS#IPPIS d. MISSI#IPPIS

6. Define Dynamic Typing in a sentence.

7. Identify the correct possible output for the following python code:

a=20

def convert(a):

b=20

a=a+b

convert(10)

print(a)

- a. 10 b. 20 c. 30 d. Error

8. Which out of the following functions will require math module to be invoked?

- a. len() b. sqrt() c. range() d. type()

9. For a function header as follows:

def Calc (X, Y=20):

Which one of the following function calls will give an error?

- a. Calc(15,25) b. Calc(X=15, Y=40) c. Calc(Y=25) d. Calc(X=25)

10. Which of the following is a mutable datatype?

- a. Integer b. String c. List d. Tuple

11. What is the variable defined outside all the functions referred to as?

- a. A static variable b. A global variable c. A local variable d. An automatic variable

12. Which of the following is **not** a function/method of the random module in Python?

- a. randint() b. random() c. randfloat() d. randrange()

13. A _____ is a subprogram that acts on data and often returns a value.

- a. Datatype b. Variable c) Function d) Constant

ASSERTION AND REASON:

In the following questions, a statement of **Assertion (A)** is followed by a statement of **Reason (R)**.

Mark the correct choice as

- (a) Both A and R are true and R is the correct explanation of A
- (b) Both A and R are true and R is not the correct explanation of A
- (c) A is True but R is False
- (d) A is false but R is True

14. **ASSERTION (A):**The expression "Hello".sort() in Python will give an error.

REASON(R): sort() does not exist as a function/method for strings in Python.

15. **ASSERTION (A):**Python standard library consists of number of modules.

REASON(R): A function in a module is used to simplify the code and avoids repetition.

SECTION – B (2X3=6 marks)

- 16. Write down two points of difference between local and global variable. 2
- 17. Write a program to reverse a number entered by the user using functions. 2
- 18. Differentiate formal and actual parameters or arguments with the help of an example. 2

SECTION – C (3X2=6 marks)

19. Predict the output of the following code: 3

```
d = {"apple": 15, "banana": 7, "cherry": 9}
str1 = ""
for key in d:
    str1 = str1 + str(d[key]) + "@" + "\n"
str2 = str1[:-1]
print(str2)
```

OR

Predict the output of the following code:

```
line=[4,9,12,6,20]
for l in line:
    for j in range(1,l%5):
        print(j,'#',end=" ")
    print()
```

20. Atul is a programmer working on a program to find and return the maximum value from the list. The code written below has syntactical errors. Rewrite the correct code and underline the corrections made. 3

```
def max_num (L) :
    max=L(0)
    for a in L :
        if a > max
            max=a
    return max
```

SECTION – D (4X2=8 marks)

21. Find errors (if any) in each of the following codes: 1 x 4 = 4

- i) import math
math.power(2,4)
- ii) import random
random.randint(4,16,4)
- iii) import random
random.random(2,10)
- iv) import math
math.sqrt(-256)

22. Write a function factorial(num) to return the factorial of the number received as argument. 4

SECTION – E (5x1=5 marks)

23. Surabhi has an excellent understanding of Python Libraries and she wants to write a piece of code that inputs a main string and then creates an encrypted string by embedding a short symbol based string after each character of the main string. Help her to accomplish the same. Also help her out with the program to produce the decrypted string from the encrypted string.

For example:

If the input string is I love India

Encryption key is "\$", then

The encrypted string will be: I\$ I\$o\$V\$e\$ I\$n\$d\$i\$a\$ and

The decrypted string will be: I love India

BURNPUR RIVERSIDE SCHOOL, CHITTARANJAN
PERIODIC TEST I: (2025 – 2026)
ENGLISH CORE
CLASS: XII

TIME: 1 ½ Hours**Maximum Marks: 40**

NAME: _____ **SEC.:** _____ **ROLL NO.:** _____

General Instructions:

Read the following instructions very carefully and strictly follow them:

- i. This question paper has 9 questions. All questions are compulsory.
- ii This question paper contains three sections:
 Section A: Reading Skills
 Section B: Creative Writing Skills
 Section C: Literature.
- iii. Attempt all questions based on specific instructions for each part. Write the correct question number and part thereof in your answer sheet.
- iv Separate instructions are given with each question/part, wherever necessary.
- v. Adhere to the prescribed word limit while answering the questions.

Section A: READING SKILLS (11 marks)

1. Read the following text. 11

- (1) Ghost nets aren't supernatural, but they are legitimately scary. A ghost net is a fishing net that's been lost or abandoned in the ocean. They are one particularly appalling part of the global ghost fishing problem, which includes fishing gear abandoned in the water. Any net or line left in the ocean can pose a threat to marine life. Just because a net is no longer used by fishers doesn't mean it stops working. These nets continue to trap everything in their path, presenting a major problem for the health of our oceans and marine life.
- (2) Ghost nets entangle sea turtles, dolphins and porpoises, birds, sharks, seals and more, apart from catching fish. The nets keep animals from moving freely, cause injuries, and keep mammals and birds from rising to the surface for air. Since hundreds of animals can be caught in a single net, this threat is monumental. The ghost nets harm coral reefs too-breaking corals, exposing them to disease and even blocking the reefs from needed sunlight.
- (3) Ghost nets are also a major contributor to the ocean plastics' crisis. Most modern nets are made of nylon or other plastic compounds that can last for centuries. According to a 2018 study in Scientific Reports, ghost nets make up at least 46 percent of the Great Pacific Garbage Patch. Those abandoned fishing lines and nets that do breakdown never go away; they just become smaller pieces of plastic. Marine animals mistake this microplastic for food and eat it, which can harm internal organs, keep them from eating and expose them to toxic chemicals.
- (4) Exorcising ghost nets from our oceans will require commitment, cooperation and innovation. Many groups are working to remove ghost nets from the sea and are collaborating with local fishers and governments around the world to identify target areas and remove as many nets as possible. In 2015, a single World Wildlife Fund for Nature (WWF)-led mission in the Baltic Sea hauled up 268 tons of nets, ropes and other material.
- (5) To stop these nets from becoming ghosts in the first place, conservation organisations advocate for fishing gear that can be traced to its owner, so anyone dumping nets can be fined and refundable deposits on nets to encourage returning or recycling rather than littering. Tools like sonar reflectors that can make ghost nets easier to find and working with small-scale fisheries to develop more sustainable fishing gear and practices are other suggestions. It is only by attacking this problem from all sides, together with conservation partners, fishers and supporters, can we banish ghost nets and protect our oceans.

Answer the following questions, based on the passage above.

- i. Complete the sentence by choosing an appropriate option. 1
 Ghost nets have been named so because they _____.
 (A) cause much harm to the marine life
 (B) are functional though not in use by fishers
 (C) are not owned by anyone
 (D) act as a snare for all animals in oceans
- ii. Comment on the writer's reference to the ghost nets in paragraph one, as a health 1
 problem for the oceans.
- iii. List the two ways being entangled in a ghost net is likely to impact a walrus. 2
 (Clue: Think about the type of animal a walrus is)

- iv. Select the option that conveys the opposite of 'negligible', from words used in paragraph 2. 1
 (A) unimpressive (B) monumental (C) exposing (D) threat
- v. The writer would not agree with the given statements based on paragraph 3, EXCEPT: 1
 (A) Most ghost nets take a few years to completely disintegrate.
 (B) Ghost nets contribute to the Great Pacific Garbage Patch.
 (C) Most ghost nets provide nutrition to marine animals, upon disintegration.
 (D) Ghost nets can curtail freedom of marine animals.
- vi. Some records share that fishing nets used to be made of common rope using natural fibres, prior to the 1960s. Based on your understanding of paragraph 3, list one major advantage that these had over the fishing nets being used in present times. 1
- vii. Why is it fair to say that commitment and innovation have to go hand-in-hand to rid the oceans of ghost nets? 2
- viii. Complete the given sentence with an appropriate inference, with respect to the following: 1
 The writer quotes the example of the WWF-led mission in the Baltic Sea (Paragraph 4), in order to _____.
- ix. How can the solutions, suggested in paragraph five, best be described? 1
 (A) practical (B) presentable (C) popular (D) prejudiced

Section B: CREATIVE WRITING SKILLS (09 marks)

2. Attempt **ANY ONE** of two, in about 50 words. 4
- A. ABC Public School, Hooghly has planned to stage a drama series on the life of Raja Rammohan Roy. The school is looking for talented actors and actresses. As Secretary of the Dramatic Society of the school, draft a notice to invite the students of class IX onwards to be a part of the series through a trial.
- OR**
- B. You are the Secretary of Alcove Housing Society, Kolkata. Draft a notice for the Society notice board, informing residents about the power shut down for the whole day on account of maintenance of transformer.
3. Attempt **ANY ONE** of two, in about 120-150 words. 5
- A. Child labour is very common in Indian society. There are laws against it, but they are neither respected nor enforced. Write a letter to the editor of a national daily, sharing your concern and examining the reasons for such behaviour. Provide suggestions for spreading awareness of rules and ways to ensure adherence. You are Sonam Bajpai, a concerned citizen
- OR**
- B. Write a letter to the Editor of The News Today on the fear that is spreading among people due to their anxiety over the widespread terrorism in the world. Give suggestions to curb such anti-social activities. You are Vikram/Varsha.

SECTION C: LITERATURE TEXTBOOK AND SUPPLEMENTARY READING TEXT (20 marks)

4. Read the given extracts and answer the questions for **ANY ONE** of the two, given. 3
- A. For once on the face of the Earth
 let's not speak in any language,
 let's stop for one second,
 and not move our arms so much.
 It would be an exotic moment
 without rush, without engines,
 we would all be together
 in a sudden strangeness.
- (Keeping Quiet)
- i. Why does the poet use the word "let's"? 1
- ii. Margaret Atwood said, "Language divides us into fragments, I wanted to be whole." Choose the option that correctly comments on the relationship between Margaret Atwood's words and the line from the above extract – "let's not speak in any language". 1
 (A) Atwood endorses Neruda's call to not speak in any language.
 (B) Atwood justifies Neruda's request to not engage in any speaking.
 (C) Atwood underlines Neruda's intent to stop and not speak in any language.
 (D) Atwood surrenders to Neruda's desire for silence and not speak in any language.
- iii. Why do you think the poet employs words like "exotic" and "strangeness"? 1
- OR**
- B. ... I saw my mother,
 beside me,
 doze, open mouthed, her face
 ashen like that
 of a corpse and realised with pain
 that she was as old as she
 looked but soon

- put that thought away, and
looked out at Young
Trees sprinting, the merry children spilling
out of their homes, ...
(My Mother at Sixty-Six)
- Why does the poet compare her mother's face to a corpse? Answer in one sentence. 1
 - What effect does the phrase 'open mouthed' have on the poem? 1
 - It builds a mood of surprise and shock in the poem.
 - It reveals the speaker's fear of her own death and mortality.
 - It adds to the imagery of the speaker's mother appearing dead.
 - It highlights the speaker's attempt at hiding her emotions from her mother.
 - Which of these phrases uses the same poetic device as the following line from the extract? 1
"looked out at Young Trees sprinting..."
 - that restaurant is as nice as the Big Fish
 - the pen became my highway to success
 - that fluffy cloud crying with sadness
 - the tall trees with many branches
- 5.** Read the given extracts and answer the questions for **ANY ONE** of the two, given. **2**
- A. In other words, the Tiger King is dead.
- The manner of his death is a matter of extraordinary interest. It can be revealed only at the end of the tale. The most fantastic aspect of his demise was that as soon as he was born, astrologers had foretold that one day the Tiger King would actually have to die.
- "The child will grow up to become the warrior of warriors, hero of heroes, champion of champions. But..." They bit their lips and swallowed hard. When compelled to continue, the astrologers came out with it. "This is a secret that should not be revealed at all. And yet we are forced to speak out. The child born under this star will one day have to meet its death."
(The Tiger King)
- Complete the sentence appropriately. 1
The author's purpose in using foreshadowing is to _____.
 - In the given extract, what emotion were the astrologers feeling when they "bit their lips and swallowed hard"? 1
 - Humiliation
 - Disbelief
 - Grief
 - Unease
- OR**
- B. He said I was unhappy. That made my wife kind of mad, but he explained that he meant the modern world is full of insecurity, fear, war, worry and all the rest of it, and that I just want to escape. Well, who doesn't? Everybody I know wants to escape, but they don't wander down into any third level at Grand Central Station. But that's the reason, he said, and my friends all agreed. Everything points to it, they claimed.
My stamp collecting, for example, that's a 'temporary refuge from reality.' Well, maybe, but my grandfather didn't need any refuge from reality.
(The Third Level)
- Sam's explanation to the reaction of Charley's wife was _____. 1
 (A) critical (B) aggressive (C) clarifying (D) accusatory
 - Select the option that signifies the condition of people of the 'modern world' mentioned in the extract. 1
 (1) Unsure (2) Lazy (3) Offensive (4) Anxious (5) Afraid
 (A) (1) and (3) (B) (2) and (5) (C) (2), (3) and (4)
 (D) (1), (4) and (5)
- 6.** Read the given extracts and answer the questions for **ANY ONE** of the two, given. **3**
- A. Poor man! It was in honour of this last lesson that he had put on his fine Sunday clothes, and now I understood why the old men of the village were sitting there in the back of the room. It was because they were sorry, too, that they had not gone to school more. It was their way of thanking our master for his forty years of faithful service and of showing their respect for the country that was theirs no more. (The Last Lesson)
- Why does the narrator refer to M. Hamel as 'poor man!'? 1
 - Which of the following idioms might describe the villagers' act of attending the last lesson most accurately? 1
 - 'Too good to miss'
 - 'Too little, too late'
 - 'Too many cooks spoil the broth'
 - 'Too cool for school'
 - Choose the option that might raise a question about M. Hamel's 'faithful service'. 1
 (A) When Franz came late, M. Hamel told him that he was about to begin class without him.
 (B) Franz mentioned how cranky M. Hamel was and his 'great ruler rapping on the table'.

(C) M. Hamel often sent students to water his flowers, and gave a holiday when he wanted to go fishing.

(D) M. Hamel permitted villagers to put their children 'to work on a farm or at the mills' for some extra money.

OR

- B. Then all effort ceased. I relaxed. Even my legs felt limp; and a blackness swept over my brain. It wiped out fear; it wiped out terror. There was no more panic. It was quiet and peaceful. Nothing to be afraid of. This is nice... to be drowsy... to go to sleep... no need to jump... too tired to jump... it's nice to be carried gently... to float along in space... tender arms around me... tender arms like Mother's... now I must go to sleep... I crossed to oblivion, and the curtain of life fell.

(Deep Water)

- i. Choose the correct option with reference to the two statements given below. 1

Statement 1: The author tried his best to jump out of water.

Statement 2: After a while, the author was not anxious in water.

(A) Statement 1 is the cause, Statement 2 is the effect.

(B) Statement 1 is the effect, Statement 2 is the cause.

(C) Both the statements are the effects of a common cause.

(D) Both the statements are the effects of independent causes.

- ii. The 'curtain of life fell' corresponds to an aspect of _____. 1

(A) Geometry (B) History (C) Sports (D) Drama

- iii. The purpose of using "..." in the above passage is to _____. 1

(A) show omission (B) indicate pauses

(C) shorten a dialogue (D) replace an idea

7. Answer **ANY TWO** of the following three questions, in about 40-50 words. **2x2=4**

- i. Deduce why the act of M. Hamel writing "Vive La France!", on the blackboard, is considered symbolic.

(The Last Lesson)

- ii. What qualities turned the diffident Douglas into a good swimmer?

(Deep Water)

- iii. In a world that is constantly running after 'more' chasing the next new thing, would it be fair to think of Neruda's call as a fanciful idea?

(Keeping Quiet)

8. Answer **ANY ONE** of the following two questions, in about 40-50 words. **2x1=2**

- i. How would you evaluate Sam's character? Elucidate any two qualities and substantiate with evidence from the text

(The Third Level)

- ii. When he was only ten days old, a prediction was made about the future of the Tiger King. What was ironic about it?

(The Tiger King)

9. Answer **ANY ONE** of the following two questions, in about 120-150 words. **6x1=6**

- i. Most of us do not raise our voice against injustice in our society and tend to remain mute spectators. Anees Jung in her story, 'Lost Spring' vividly highlights the miserable life of street children and bangle-makers of Firozabad. She wants us to act. Which qualities does she want the children to develop?

OR

- ii. The tiger king wanted to protect himself from the tiger attack. Describe the difficulties created by him for his officials and subjects.

BURNPUR RIVERSIDE SCHOOL, CHITTARANJAN
PERIODIC TEST I: (2025 – 2026)
INFORMATION TECHNOLOGY
CLASS: XII

Time: 1 ½ Hours

Maximum Marks: 40

NAME: _____

SEC.: _____ ROLL NO.: _____

General Instructions:

1. Please read the instructions carefully.
2. This Question Paper consists of **17 questions** in two sections – Section A & Section B.
3. Section A has Objective type questions whereas Section B contains Subjective type questions.
4. **Out of the given (5 + 12 =) 17 questions, a candidate has to answer (5 + 8 =) 13 questions in the allotted (maximum) time of 1 ½ hours.**
5. All questions of a particular section must be attempted in the correct order.
6. **SECTION A - OBJECTIVE TYPE QUESTIONS (20 MARKS):**
 - i. This section has 05 questions.
 - ii. There is no negative marking.
 - iii. Do as per the instructions given.
 - iv. Marks allotted are mentioned against each question/part.
7. **SECTION B – SUBJECTIVE TYPE QUESTIONS (20 MARKS):**
 - i. This section contains 12 questions.
 - ii. A candidate has to do 8 questions.
 - iii. Do as per the instructions given.
 - iv. Marks allotted are mentioned against each question/part.

SECTION A: OBJECTIVE TYPE QUESTIONS

1. **Answer any 4 out of the given 6 questions on Employability Skills: (1 X 4 = 4 marks)**
 - i. Which out of these is **not** a part of skill for effective communication? 1
a) Learning b) Listening c) Reading d) Writing
 - ii. How many steps are there to Active Listening? 1
a) 2 b) 4 c) 5 d) 7
 - iii. What should you be doing before appearing for an interview? 1
a) Use your mobile b) Eat a good breakfast c) Talk fast d) Sleep late
 - iv. Write any two qualities of an Entrepreneur. 1
 - v. A manufacturer of automobile spare parts, computer accessories etc. is considered as _____ entrepreneur. 1
a) business b) industrial c) agricultural d) technical
 - vi. Pushkar works for Surabhi, who is a businesswoman. Pushkar is a/an _____. 1
a) entrepreneur b) businessman c) wage-employee d) skilled worker
2. **Answer any 4 out of the given 5 questions: (1 X 4 = 4 marks)**
 - i. What are constraints? 1
 - ii. Which out of these is not a DDL command? 1
a) Alter table b) Drop table c) Update d) Create table
 - iii. Which command is used to see the structure of the table created? 1
a) DESC b) DISTINCT c) CREATE d) USE
 - iv. _____ command displays all the tables created in the current database. 1
 - v. eBay was founded in the year _____. 1
a) 1992 b) 1993 c) 1994 d) 1995
3. **Answer any 4 out of the given 5 questions: (1 X 4 = 4 marks)**
 - i. Which out of these is **not** an online booking site? 1
a) IRCTC b) Yatra c) NTES d) MakeMyTrip
 - ii. Name the national portal of India. 1
 - iii. _____ key is used to set the referential integrity constraint. 1
a) Primary b) Foreign c) Alternate d) Candidate
 - iv. DCL stands for _____. 1
 - v. How many stages of Web Development cycle are there? 1
a) 4 b) 5 c) 6 d) 7
4. **Answer any 4 out of the given 5 questions: (1 X 4 = 4 marks)**
 - i. Which out of these is a DCL command? 1
a) GRANT b) CASCADE c) RESTRICT d) SET NULL
 - ii. _____ offers free tutorials in all web development technologies. 1
a) courser.org b) udacity.org c) udemy.com d) w3schools.com
 - iii. Expand NSP. 1
 - iv. How many referential actions can be implemented using Foreign key? 1
a) 1 b) 2 c) 3 d) 4

- v. Which out of these is **not** an aggregate function in SQL? 1
 a) AVERAGE() b) COUNT() c) MAX() d) SUM()
5. **Answer any 4 out of the given 5 questions: (1 X 4 = 4 marks)**
- i. Which two constraints can be used with DROP table command? 1
 ii. Which is the last stage of web development cycle? 1
 a) Design b) Planning c) Maintenance d) Testing
 iii. Name the Indian e-governance portal. 1
 iv. How many SQL constraints are there? 1
 a) 4 b) 5 c) 6 d) 7
 v. What do you mean by Data Redundancy? 1

SECTION B: SUBJECTIVE TYPE QUESTIONS

Answer any 3 out of given 5 questions on Employability Skills (2 X 3 = 6 marks)

Answer each questions in 20-30 words

6. What are the stages of active listening? 2
 7. Write the advantages of active listening at workplace. 2
 8. What are the things that you should do during an interview? 2
 9. Write four common fears among entrepreneurs. 2
 10. Write two points of difference between wage employment and entrepreneurship. 2

Answer any 2 out of the given 3 questions (2X2=4 marks)

11. Write an SQL query to change the size of a field name NAME in Student table to datatype char and size 30. 2
 12. Write any four precautions that should be taken while performing online transactions. 2
 13. Write any 2 advantages of online learning. 2

Answer any 2 out of the given 3 questions

(3X2= 6 marks)

14. What is a project? Write few characteristics of a project. 3
 15. What are the advantages of using DBMS? 3
 16. Consider the following table named

"GYM" with details about Fitness products being sold in the store. PrCode stores Codes of Products, PrName stores names of Products (UnitPrice is in Rs.)

- i. Arrange the table in ascending order of product name.
 ii. Display the details of the products whose price is between 25000 to 35000
 iii. Update the name of the company from "Fit Express" to "KG Fitness".

PrCode	PrName	UnitPrice	Manufacturer
P101	Cross Trainer	25000	Avon Fitness
P102	TreadMill	32000	AG Fitline
P103	Massage Chair	20000	Fit Express
P104	Vibration Trainer	22000	Avon Fitness
P105	Bike	13000	Fit Express

3

Answer the following question

(4X1= 4 marks)

17. Given the table STUDENT. Go through the table and answer the questions that follows:

Table: STUDENT						
No.	Name	Stipend	Stream	Avg-Marks	Grade	Class
1	Karan	400.00	Medical	78.5	B	12B
2	Divakar	450.00	Commerce	89.2	A	11C
3	Divya	300.00	Commerce	68.6	C	12C
4	Arun	350.00	Humanities	73.1	B	12C
5	Sabina	500.00	Non-medical	90.6	A	11A
6	John	400.00	Medical	75.4	B	12B
7	Robert	250.00	Humanities	64.4	C	11A
8	Rubina	450.00	Non-medical	88.5	A	12A
9	Vikas	500.00	Non-medical	92.0	A	12A
10	Mohan	300.00	Commerce	67.5	C	12C

4

What will be the output of the following:

- a) Select Name, stipend from student where stipend between 400 and 500; 1/2
 b) Select Stream, avg_marks from student where stream = "non-medical" 1/2
 Write the SQL query for the following:
 c) Display the name and stream of the students in ascending order of name where the stipend is more than 300. 1
 d) Display the number of students in each stream. 1
 e) Display the detail of the students whose name ends with 'a'. 1

BURNPUR RIVERSIDE SCHOOL, CHITTARANJAN
PERIODIC TEST I : (2025-26)
PHYSICS
CLASS: XII

Time: 1 ½ Hours

Maximum Marks: 40

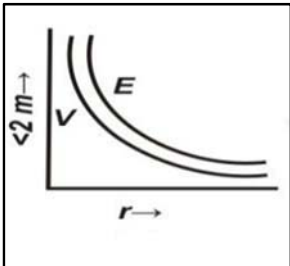
NAME: _____ SEC.: ____ ROLL NO.: ____

General Instructions:

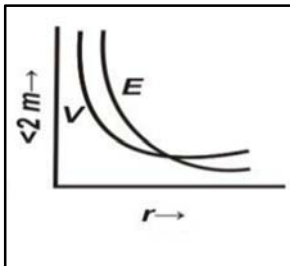
- (i) There are **18 questions** in all. All questions are compulsory.
- (ii) This question paper has five sections: Section A, Section B, Section C, Section D and Section E.
- (iii) **Section A** contains eight MCQ of one mark each, **Section B** contains three questions of two marks each, **Section C** contains four questions of three marks each, **Section D** contains one case study-based question of four marks and **Section E** contains two long answer type questions of five marks each.
- (iv) There is no overall choice. However, an **internal choice** has been provided in one question in Section B, one question in Section C, one subpart of case study-based question in Section D and both the questions in Section E. You have to attempt only one of the choices in such questions.
- (v) Use of calculator is not allowed.

SECTION - A

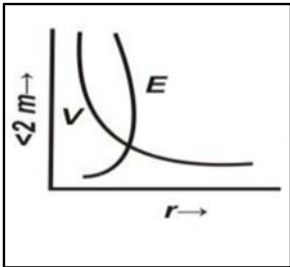
1. Two charged spheres separated by a distance d exert some force F on each other. If they are immersed in a liquid of dielectric constant 4, then what is the force exerted, if all other conditions are same? 1
- (a) $2F$ (b) $4F$ (c) $F/2$ (d) $F/4$
2. The electric field due to a dipole (of dipole moment p) is proportional to – 1
- (a) r^{-2} (b) r^{-3} (c) r^{-1} (d) r
3. The correct variation of electric potential(V) and electric field(E) with distance(r) from a point charge is given by – 1
- (a)



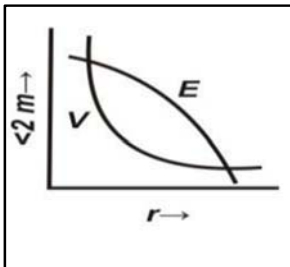
(b)



(c)



(d)


4. If 125 water drops of equal radius and equal capacitance C , coalesce to form a single drop of capacitance C' , then the relation between C and C' is – 1
- (a) $C' = C$ (b) $C' = 5C$ (c) $C' = 125C$ (d) $C' = 250C$

5. $1\mu\text{F}$ is equal to – 1
 (a) 1 C per 1 V (b) 1 C per 1 kV (c) 1 mC per 1 kV (d) 1 kC per 1 V
6. The energy stored in a capacitor is actually stored – 1
 (a) between the plates (b) on the positive plate
 (c) on the negative plate (d) on the outer surfaces of the plates
7. **Assertion:** The dielectric constant for metals is infinity. 1
Reason: When a charged capacitor is filled completely with a metal slab, its capacity becomes very large.
 a) Both A and R are true, and R is correct explanation of the assertion.
 b) Both A and R are true, but R is not the correct explanation of the assertion.
 c) A is true, but R is false.
 d) A is false and R is also false.
8. **Assertion:** If there exists coulomb attraction between two bodies, any one of them may not be charged.
Reason: In coulomb attraction two bodies are oppositely charged.
 a) Both A and R are true, and R is correct explanation of the assertion.
 b) Both A and R are true, but R is not the correct explanation of the assertion.
 c) A is true, but R is false.
 d) A is false and R is also false.

SECTION - B

9. Four point charges of $2\mu\text{C}$, $-4\mu\text{C}$, $2\mu\text{C}$ and $-2\mu\text{C}$ are placed at the corners A, B, C and D respectively, of a square of side 30 cm. Find the net force acting on a charge of $4\mu\text{C}$ placed at the centre of the square. 2
10. In a certain 0.5 cm^3 of space, electric potential is found to be 7 V throughout. What is the electric field in this region? 2
11. A parallel plate capacitor with air between the plates has a capacitance of 8 pF ($1\text{pF} = 10^{-12}\text{ F}$). What will be the capacitance if the distance between the plates is reduced by half and the space between them is filled with a dielectric of dielectric constant 6? 2

OR

State the nature of equipotential surface for – (i) line charge and (ii) surface charge.

SECTION - C

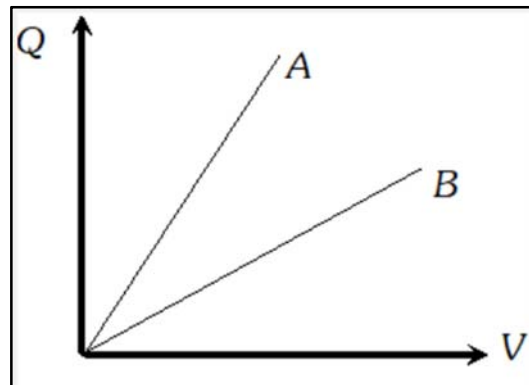
12. (i) Define the term 'electric flux' and write its dimensions. 3
 (ii) A plane surface, in shape of a square of side 1 cm is placed in an electric field $\mathbf{E} = (100\text{ NC}^{-1})\mathbf{i}$ such that the unit vector normal to the surface is given by $\mathbf{n} = 0.8\mathbf{i} + 0.6\mathbf{k}$. Find the electric flux through the surface.

OR

Two point charges $(+5)\mu\text{C}$ and $(-2)\mu\text{C}$ are placed at the vertices B and C of an equilateral triangle ABC of side 10 cm. Obtain the expression for the magnitude and the direction of the resultant electric field at the vertex A due to these two charges.

13. The capacitance of a capacitor becomes $7/6$ times its actual capacitance when a dielectric slab of thickness $2d/3$ (where d is the separation between plates) is inserted between the plates. Find the dielectric constant of the slab. 3

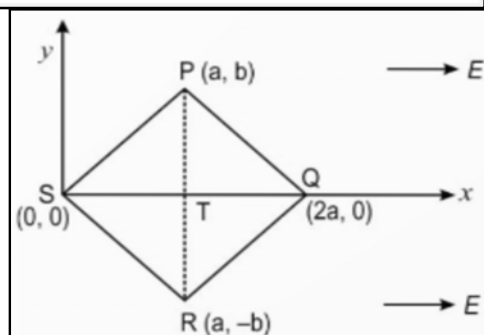
14. The given graphs (A and B) show the variation of charge Q with potential difference V for two capacitors C_1 and C_2 . The two capacitors have the same plate separation but plate area of C_2 is double of that of C_1 . Which of the line corresponds to C_1 and why?



3

15. A test charge q moves along the path P to Q to R to S in a region of uniform electric field directed along $+X$. (as shown beside)
The coordinates of the points are given as –

P(a,b), Q(2a,0), R(a,-b) and S(0,0)



3

(a) Identify the plane of motion of the test charge.

(b) Determine the work done by the electric field as the test charge moves from P to S.

SECTION – D

16. **Read the text carefully and answer the questions:**

4

The simplest and the most widely used capacitor is the parallel plate capacitor. It consists of two large plane parallel plates, separated by a small distance. As a result, we get three regions of different electric fields one between the plates and the other two outside the plates. The electric field between and outside the plates are determined using Gauss's Theorem.

The capacitance of parallel plate capacitor is defined as the amount of charge required to be supplied to the plates to produce a unit potential difference across the two plates. And from the interrelation between electric field and potential we can find an expression of potential in terms of distance between the plates.

- (i) The electric field is non-zero in the region -
 - (a) outside of positive plate
 - (b) outside of negative plate
 - (c) between the plates
 - (d) very close to the positive plate
- (ii) The capacitance of a parallel plate capacitor increases with increase in –
 - (a) distance between plates
 - (b) area of each plate
 - (c) electric field between the plates
 - (d) charge density on each plate
- (iii) To produce 1pF capacitance for plate area of 1 m^2 in vacuum, the separation between plates has to be -
 - (a) 88.5 cm
 - (b) 88.5 m
 - (c) 8.85 cm
 - (d) 8.85 m
- (iv) A dielectric medium, introduced between plates of capacitor, increases -
 - (a) net charge density
 - (b) charge on each plate
 - (c) capacitance of the capacitor
 - (d) electric field between the plates

OR

What happens to the potential difference between the plates of a parallel plate capacitor when their intermediate distance is reduced?

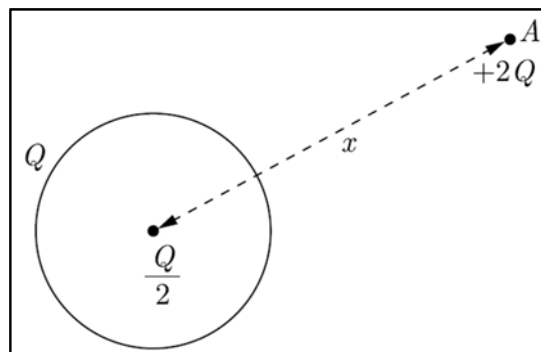
- (a) increases (b) decreases (c) remains same (d) become zero

SECTION – E

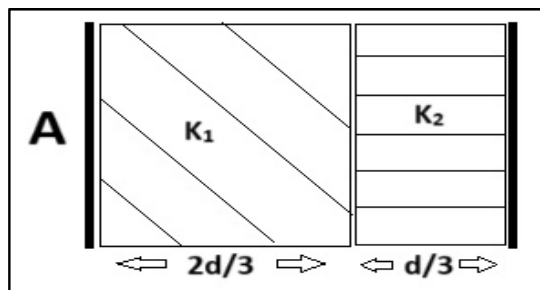
17. (i) Define electric field and write its CGS unit. 5
 (ii) State and prove Gauss's theorem.

OR

A thin metallic spherical shell of radius R carries a charge Q on its surface. A point charge $Q/2$ is placed at the centres C and other charge $+2Q$ is placed outside the shell at A at a distance x from the centre as shown in the figure.



- (a) Find the electric flux through the shell.
 (b) State the law used.
 (c) Find the force on the charges at the centre C of the shell and at the point A .
18. (i) Derive an expression for the capacitance of a parallel plate capacitor. 5
 (ii) If two dielectric medium (of constant K_1 and K_2) is introduced between the plates of the capacitor (as shown), how will the capacitance of the capacitor change?



OR

- (i) Derive the expression for the energy stored in parallel plate capacitor. Hence, obtain the expression for the energy density of the electric field.
 (ii) A fully charged parallel plate capacitor is connected across an uncharged identical capacitor. Show that the energy stored in the combination is less than stored initially in the single capacitor.

Maximum Marks: 40

General Instructions:

1. Marks for questions are indicated against each question.
2. Question No. 1-10 are 1 mark questions and are to be answered in one word.
3. Question No.11-12 are 3 marks questions and are to be answered in 60-80 words each.
4. Question no.13-15 are 4 marks questions and are to be answered in 80-100 words each.
5. Question No.16-17 are 6 marks questions and are to be answered in 100-150 words each.
Question No.17 is a Case-Based question.
6. Answers should be brief and to the point and the above word limit be adhered to as far as possible.

1. On the eve of independence, India was the net importer of.....

 - a) primary products
 - b) agricultural products
 - c) industrial products
 - d) finished products.

(Choose the most appropriate option)
2. An economy in which means of production are used in a manner such that profits are maximized is known as

 - a) socialist economy
 - b) capitalist economy
 - c) mixed economy
 - d) productive economy.

(Choose the most appropriate option)
3. Read the following statements : Assertion (A) and Reason (R). Choose the most appropriate option given below:

Assertion (A): The major policy initiatives i.e. land reforms and green revolution helped India to become self-sufficient in food grain production.

Reason (R) : The proportion of people depending on agriculture did not decline as expected.

 - a) Both A & R are true and R is the correct explanation of A.
 - b) Both A & R are true but R is not the correct explanation of A.
 - c) A is true but R is false.
 - d) A is false but R is true.
4. Read the following statements carefully and choose the correct alternative from the following:

Statement 1: Economic reforms of 1991 paved the way for the liberalization of Indian economy.

Statement 2: Economic reforms of 1991 relaxed the restrictions imposed by the government on private sector.

 - a) Both the statements are true.
 - b) Both the statements are false.
 - c) Statement 1 is true but Statement 2 is false.
 - d) Statement 2 is true but Statement 1 is false.
5. How did globalization impact Indian agriculture after 1991?

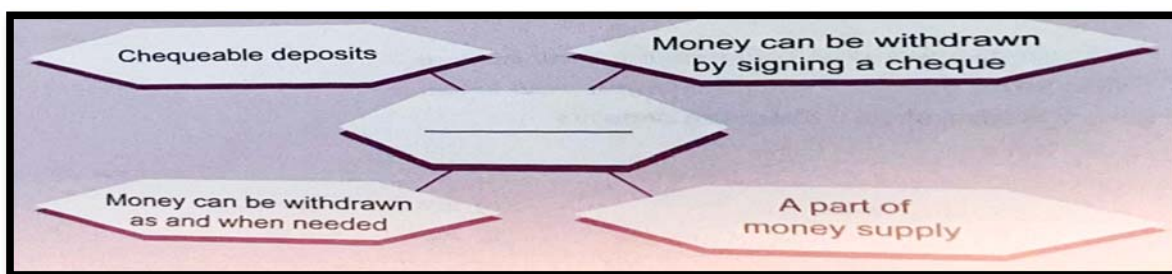
 - a) Increased subsidies for farmers
 - b) Complete reliance on imports
 - c) Enhanced competition and access to global markets
 - d) Decreased crop yields.

(Choose the most appropriate option)
6. Which of the following statements is associated with general equilibrium analysis?

 - a) Equilibrium price of a good in the competitive market
 - b) Equilibrium in the market of gold ornaments
 - c) Equilibrium across all the markets in the economy
 - d) Equilibrium in the world market.

(Choose the most appropriate option)

7. 1



Choose the correct option to fill in the blank:

- a) Term Deposit b) Recurring Deposit c) Income Scheme d) Demand Deposit.

(Choose the most appropriate option)

8. Match the following: 1

Column I

A Macro variables

B Microeconomics

C Determination of overall level of output

D National Income

Column II

i) Limited degree of aggregation of economic

ii) A macroeconomic variable

iii) Central issue of macroeconomics

iv) Means large.

Choose the most appropriate option:

a) A-i, B-ii, C-iii, D-iv

b) A-ii, B-iv, C-i, D-iii

c) A-ii, B-iii, C-iv, D-i

d) A-iv, B-i, C-iii, D-ii

9. Read the following statements carefully and choose the correct alternative from the following: 1

Statement 1: Stock of money with the government is a part of money supply.

Statement 2: Money can be withdrawn by the depositors as and when needed in case of term deposits.

a) Both the statements are true.

b) Both the statements are false.

c) Statement 1 is true but Statement 2 is false.

d) Statement 2 is true but Statement 1 is false.

10. Read the following statements: Assertion (A) and Reason (R). Choose the most appropriate option given below: 1

Assertion (A): The Central Bank is an apex bank of the entire banking system of a country.

Reason (R) : All the banks are to work as per the guidelines of the Central Bank.

a) Both A & R are true and R is the correct explanation of A.

b) Both A & R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

11. What in your view were the six main features of economic backwardness in the Indian economy on the eve of independence? 3

12. Critically analyse any two functions of Central Bank. 3

OR

Differentiate between Central Bank and Commercial Bank.

13. Explain the significance of standard of deferred payments and store of value functions of money. 4

OR

Explain any four drawbacks of Barter system.

14. How Macroeconomics differs from Microeconomics? 4

15. 'An equally strong case can be made in favour of and against agricultural subsidies'. Do you agree? Give reasons for your answer. 4

16. Explain the process of money creation by the commercial bank with the help of a hypothetical table. 6

OR

How does Central Bank control credit in an economy by

a) Open market operation

b) Bank rate?

17. Read the text and answer the following questions: 6

The process of globalization through liberalization and privatization policies has produced

positive and negative results both for India and other countries. It is argued that globalization should be seen as an opportunity for the developing countries in terms of becoming important players in the international arena. On the other hand, it is argued that globalization is a strategy of developed countries to expand their markets in other countries. It is held that the market driven globalization has widened the economic disparities among the nations and the people by further compromising the welfare and the identity of the people belonging to the poor countries. Further it has increased the income and quality of consumption of only high income groups with the growth concentrating selected areas in service sector like IT, telecommunication etc.

- i) What do you mean by globalization? (1)
- ii) How do liberalization affect globalization? (2)
- iii) Write any two positive effects and any one negative effect of globalization. (3)

BURNPUR RIVERSIDE SCHOOL, CHITTARANJAN
PERIODIC TEST I: (2025-2026)
MATHEMATICS
CLASS: XII

Time: 1½ Hours

Maximum Marks: 40

NAME: _____ SEC.: _____ ROLL NO.: _____

General Instructions:

This Question paper contains- five sections A, B, C, D and E. Each section is compulsory. However, there are internal choices in some questions.

Section A has 9 MCQ's and 01 Assertion-Reason based questions of 1 mark each.

Section B has 3 Very Short Answer (VSA)-type questions of 2 marks each.

Section C has 2 Short Answer (SA)-type questions of 3 marks each.

Section D has 2 Long Answer (LA)-type questions of 5 marks each.

Section E has 2 source based/case based/passage based/integrated units of assessment (4 marks each) with subparts.

Section-A**All questions are compulsory.**

1. If R is a relation in the set **N** given by $R = \{(a, b) : a = b - 2, b > 6\}$. Choose the correct answer. 1
 a. $(2, 4) \in R$ b. $(3, 8) \in R$ c. $(6, 8) \in R$ d. $(8, 7) \in R$
2. If $A = \{1, 2, 3\}$. Then the number of equivalence relation containing $(1, 2)$ is 1
 a. 1 b. 2 c. 3 d. 4
3. If A, B are symmetric matrices of same order, then $AB - BA$ is a 1
 a. Skew symmetric matrix b. Symmetric matrix
 c. Zero matrix d. Identity matrix
4. Let A be a non singular square matrix of order 3×3 . Then $|adj A|$ is equal to 1
 a. $|A|$ b. $|A|^2$ c. $|A|^3$ d. $3|A|$
5. The derivative of x^{2x} w.r.t. x is 1
 a. x^{2x-1} b. $2x^{2x} \log x$ c. $2x^{2x}(1 + \log x)$ d. $2x^{2x}(1 - \log x)$
6. The function $f(x) = |x|$ is 1
 a. Continuous and differentiable at $x = 0$ b. Continuous but not differentiable at $x = 0$
 c. Discontinuous at $x = 0$ d. not defined at $x = 0$
7. The function $f(x) = \tan x$ is not continuous at 1
 a. $x = \frac{\pi}{2}$ b. $x = 0$ c. $x = \frac{\pi}{4}$ d. $x = \pi$
8. If a matrix is multiplied by its adjoint, the result is: 1
 a. The identity matrix b. Scalar multiple of the identity matrix
 c. A zero matrix d. None of these
9. Which of the following is a many-one function? 1
 a. $f(x) = x^3$ b. $f(x) = x$ c. $f(x) = |x|$ d. $f(x) = \sqrt{x}$
10. **Assertion (A):** Let $y = t^{10} + 1$ and $x = t^8 + 1$, then $\frac{d^2y}{dx^2} = 20t^8$ 1
Reason (R): $\frac{d^2y}{dx^2} = \frac{d}{dx} \left(\frac{dy}{dx} \right)$
 a) Both A and R are true and R is the correct explanation of A.
 b) Both A and R are true but R is not the correct explanation of A.
 c) A is true but R is false.
 d) A is false but R is true.

Section-B**All questions are compulsory. In case of internal choices attempt any one.**

11. Find $\frac{dy}{dx}$ where $x = 2at^2$ and $y = at^4$ 2
12. Differentiate $\sqrt{e^{\sqrt{x}}}$ w.r.t. x . 2

13. (A) If the points $(2, -3), (\lambda, -1)$ and $(0, 4)$ are collinear, find the value of λ . 2

OR

- (B) If $A = \begin{bmatrix} 3 & -5 \\ 2 & 0 \end{bmatrix}$, and $B = \begin{bmatrix} 1 & 17 \\ 0 & -10 \end{bmatrix}$ then find $|AB|$

Section-C

All questions are compulsory. In case of internal choices attempt any one.

14. (A) Find $\frac{dy}{dx} : x^y + y^x = 1$ 3

OR

- (B) If $y = \sin^{-1}x$, show that $(1 - x^2) \frac{d^2y}{dx^2} - x \frac{dy}{dx} = 0$

15. Find the values of k for which the function f is continuous at $\frac{\pi}{2}$. 3

$$f(x) = \begin{cases} \frac{k \cos x}{\pi - 2x}, & \text{if } x \neq \frac{\pi}{2} \\ 3, & \text{if } x = \frac{\pi}{2} \end{cases}$$

Section-D

All questions are compulsory. In case of internal choices attempt any one.

16. If $A = \frac{1}{9} \begin{bmatrix} -8 & 1 & 4 \\ 4 & 4 & 7 \\ 1 & -8 & 4 \end{bmatrix}$, find A^{-1} . 5

17. (A) Let $A = R - \{2\}$ and $B = R - \{1\}$. If $f: A \rightarrow B$ is a function defined by $f(x) = \frac{x-1}{x-2}$, show that f is one-one and onto function. 5

OR

- (B) Show that the function $f: R \rightarrow \{x \in R : -1 < x < 1\}$ defined by $f(x) = \frac{x}{1+|x|}$, $x \in R$ is one-one and onto function.

Section-E

18. **Read the text carefully and answer the questions:** 4

There are two families A and B. There are 4 men, 6 women and 2 children in family A and 2 men, 2 women and 4 children in family B. The recommended daily allowance for calories is 2400 for men, 1900 for women, 1800 for children and for proteins 45gm for men, 55gm for women and 33gm for children.

- Represent the above information by matrices.
- Using matrix multiplication, calculate the total requirement of calories and proteins for each of two families.

19. **Read the text carefully and answer the questions:** 4

The earth has 24 time zones, defined by dividing the earth into 24 equal longitudinal segments. These are regions on earth that have the same standard time. For example, USA and India fall in different time zones, but Sri Lanka and India are in the same time zone. A relation R defined on the set $U = \{\text{All people in the earth}\}$ such that $R = \{(x, y) : \text{the time difference between the time zones } x \text{ and } y \text{ reside in is 6 hours}\}$

- Check whether the relation R is symmetric.
- Check whether the relation is reflexive.
- (A) Check whether the relation is transitive.

OR

- (B) Is it always true that if a function is symmetric and transitive then reflexive also? Justify your answer.