



**IIT**

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**KALRASHUKLA**

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*A Class Apart*

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**CLASS – 12<sup>th</sup> (MEDICAL)**

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**Time : 90 minutes**

**Maximum Marks : 180**

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**-: Important Instructions :-**

- (i) Use only Black Ball Point pen.
  - (ii) This test booklet contains 4 Sections of question paper consisting of
    - SECTION - I → PHYSICS (10 Questions)
    - SECTION - II → CHEMISTRY (10 Questions)
    - SECTION - III → BIOLOGY (10 Questions)
    - SECTION - IV → MENTAL ABILITY & REASONING (15 Questions)
  - (iii) Each question is allotted **4 marks for correct response**.
  - (iv) **1 mark will be deducted** for marking incorrect or multiple responses.
  - (v) No deduction will be made from total marks for unattempted questions.
  - (vi) For each question, there is **only 1 correct** response.
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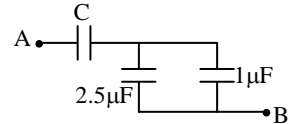
**Name of Student (in Capital Letter) :** \_\_\_\_\_

**Candidate Signature :** \_\_\_\_\_

**Invigilator Signature :** \_\_\_\_\_

**SECTION - I****PHYSICS**

1. A soap bubble is given a negative charge. Then its radius  
(A) decreases  
(B) increases  
(C) remains unchanged  
(D) will change but the information is insufficient to predict whether it will increase or decrease.
2. The equivalent capacitance between A and B in the figure is  $1\mu\text{F}$ . Then the value of the capacitance C is  
(A)  $1.4\mu\text{F}$   
(B)  $2.5\mu\text{F}$   
(C)  $3.5\mu\text{F}$   
(D)  $1.2\mu\text{F}$
3. The specific resistance of a wire  
(A) varies with its length  
(B) varies with its cross-section  
(C) varies with its mass  
(D) does not depend on its length, cross-section and mass



*Space for Rough Work*

4. A horizontal wire of length 10 cm and mass 0.3 g carries a current of 5A. The minimum magnitude of the magnetic field which can support the weight of the wire is ( $g = 10 \text{ m/s}^2$ )  
(A)  $3 \times 10^{-3} \text{ T}$  (B)  $6 \times 10^{-3} \text{ T}$   
(C)  $3 \times 10^{-4} \text{ T}$  (D)  $6 \times 10^{-4} \text{ T}$
5. The area enclosed by a hysteresis loop is a measure of  
(A) retentivity (B) susceptibility  
(C) permeability (D) energy loss per cycle
6. A coil having 500 square loops, each of side 10 cm, is placed normal to a magnetic field which is increasing at the rate of 1.0 tesla per second. The induced emf is  
(A) 0.1 V (B) 0.5 V (C) 1 V (D) 5 V
7. A step –down transformer transforms a supply line voltage of 2200 volt into 220 volt. The primary coil has 5000 turns. The efficiency and power transmitted by the transformer are 90% and 8 kilowatt respectively. Then the number of turns in the secondary is  
(A) 5000 (B) 50 (C) 500 (D) 5

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8. A concave mirror of focal length  $f$  (in air) is immersed in water ( $\mu = 4/3$ ). The focal length of mirror in water will be
- (A)  $f$  (B)  $\frac{4}{3}f$   
(C)  $\frac{3}{4}f$  (D)  $\frac{7}{3}f$
9. For most distinct interference patterns to be observed the necessary condition is that the ratio of intensities of light waves from the two coherent sources should be:
- (A) 1 : 1 (B) 1 : 2  
(C) 1 : 3 (D) 1 : 4
10. Nuclear radius of  ${}_8\text{O}^{16}$  is 3 fermi. The nuclear radius of  ${}_{82}\text{Pb}^{205}$  is
- (A) 5.02 fermi (B) 6.02 fermi  
(C) 7.02 fermi (D) 8.02 fermi

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**SECTION - II****CHEMISTRY**

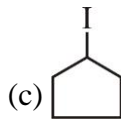
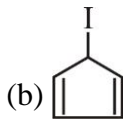
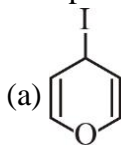
11. A certain solute upon dissolution in some solvent undergoes 45% trimerization and 40% dimerization. What is the value of  $\frac{1}{i}$  for this situation :
- (A) 1                      (B) 2                      (C) 0.5                      (D) 4
12. Zn Amalgam is prepared by electrolysis of aqueous  $\text{ZnCl}_2$  using Hg cathode (9gm.) How much current is to be passed through  $\text{ZnCl}_2$  solution for 1000 seconds to prepare a Zn Amalgam with 25% Zn by wt. ( $\text{Zn} = 65.4$ )
- (A) 5.6 amp                      (B) 7.2 amp  
(C) 8.85 amp                      (D) 11.2 amp
13. Which of the following parent oxy acid does not have its Hypo acid.
- (A)  $\text{H}_2\text{SO}_4$                       (B)  $\text{HNO}_2$   
(C)  $\text{H}_3\text{PO}_3$                       (D)  $\text{HClO}_3$

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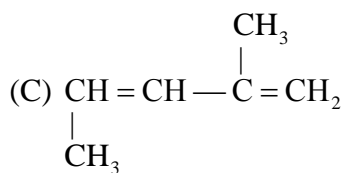
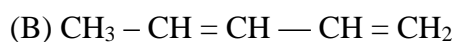
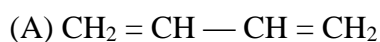
14. The EAN of metal atoms in  $[\text{Fe}(\text{CO})_2(\text{NO}^+)_2]$  and  $\text{Co}_2(\text{CO})_8$  respectively are :  
 (A) 34, 35                      (B) 34, 36                      (C) 36, 36                      (D) 36, 35

15. Compare rate of  $\text{S}_{\text{N}}1$  reaction?



- (A)  $a > b > c$                       (B)  $a > c > b$                       (C)  $c > b > a$                       (D)  $b > a > c$

16.  $\text{CH}_3\text{COCH}_3 \xrightarrow{\text{CH}_3\text{C}\equiv\text{CNa}^{\oplus}} \text{X} \xrightarrow{\text{H}_2\text{O}} \text{Y} \xrightarrow{\text{H}_2, \text{Pd}+\text{CaCO}_3} \text{Z} \xrightarrow{\text{Al}_2\text{O}_3} \text{W}$ , W is :



17.  $\xrightarrow{\text{NBS}} (\text{A}) \xrightarrow{\text{alc. KOH}} (\text{B}) \xrightarrow{\text{HBr, peroxide}} (\text{C}) \xrightarrow{\text{aq. KOH}} (\text{D}) \xrightarrow{\text{PCC}} (\text{E}) \xrightarrow{\text{aq. KOH, } \Delta} (\text{F})$

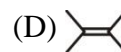
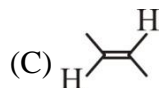
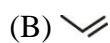
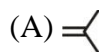
Number of Geometrical isomer of compound F is.

- (A) 2                      (B) 4                      (C) 8                      (D) 12

*Space for Rough Work*

18. The number of dipeptides that can be made from alanine and glycine are  
 (A) 6 (B) 2 (C) 3 (D) 4

19.  $\text{-(CH}_2\text{-}\overset{\text{CH}_3}{\underset{\text{CH}_3}{\text{C}}}\text{-CH}_2\text{-}\overset{\text{CH}_3}{\underset{\text{CH}_3}{\text{C}}}\text{)}_n$  is a polymer having monomer units \_\_\_\_\_.



20.  $[\text{Fe}(\text{H}_2\text{O})_5\text{NO}]\text{SO}_4$  and  $[\text{Cr}(\text{NH}_3)_6](\text{NO}_2)_3$  both are paramagnetic species with 'spin only' magnetic moment of 3.93 B.M. The hybridisation of central metal ions in these species respectively are :  
 (A) both  $\text{sp}^3\text{d}^2$  (B) both  $\text{d}^2\text{sp}^3$  (C)  $\text{sp}^3\text{d}^2$  and  $\text{d}^2\text{sp}^3$  (D)  $\text{d}^2\text{sp}^3$  and  $\text{sp}^3\text{d}^2$

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**SECTION - III****BIOLOGY**

21. Filiform apparatus is characteristic feature of  
(A) Aleurone cell (B) Synergids  
(C) Generative cell (D) Nucellar embryo
22. Which of the following cells during gametogenesis is normally diploid?  
(A) Spermatogonia (B) Secondary polar body  
(C) Primary polar body (D) Spermatid
23. In his classic experiments on pea plants, Mendel did not use  
(A) Seed shape (B) Flower position  
(C) Seed colour (D) Pod length
24. Initiation codon in eukaryotes is  
(A) GAU (B) AGU (C) AUG (D) UAG
25. Peripatus is a connecting link between  
(A) Mollusca and echinodermata (B) Annelida and arthropoda  
(C) Coelenterata and porifera (D) Ctenophora and platyhelminthes
26. HIV that causes AIDS, first starts destroying  
(A) Helper T-lymphocytes (B) Thrombocytes  
(C) B-lymphocytes (D) Leucocytes
27. The guts of cow and buffalo possess  
(A) Methanogens (B) Cyanobacteria  
(C) Fucus sp. (D) Chlorella sp.
28. The cutting of DNA at specific locations become possible with the discovery of  
(A) Selectable markers (B) Ligases  
(C) Restriction enzymes (D) Probes
29. Golden rice is a genetically modified crop plant where the incorporated gene is meant for biosynthesis of  
(A) Omega 3 (B) Vitamin A (C) Vitamin B (D) Vitamin C
30. The mass of living material at a trophic level at a particular time is called  
(A) Net primary productivity (B) Standing crop  
(C) Gross primary productivity (D) Standing state

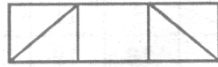
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**SECTION -IV****MENTAL ABILITY & REASONING**

31. How many quadrilaterals are there in the following figure ?



- (A) 11                      (B) 8                      (C) 2                      (D) 4
32. Find the wrong term -  
9, 11, 15, 23, 39, 70, 135  
(A) 23                      (B) 39                      (C) 70                      (D) 135
33. A watch reads 4 : 30. If the minute - hand points to East, in which direction does the hour-hand point ?  
(A) North-East              (B) South-East              (C) North-West              (D) North
34. The time in the clock is 4 : 46, what is the mirror image ?  
(A) 7 : 24                      (B) 7 : 14                      (C) 8 : 14                      (D) 8 : 24
35. Neelam, who is Rohit's daughter, says to Indu, "Your mother Reeta is the younger sister of my father, who is the third child of Sohanji. " How is Sohanji related to Indu ?  
(A) Maternal-uncle                      (B) Grandfather  
(C) Father                                      (D) Father-in-law

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36. If the seventh day of month is three days earlier than Friday, what day will it be one the nineteenth day of the month ?  
(A) Sunday (B) Monday (C) Wednesday (D) Friday
37. Sum of the Proper divisors of 100.  
(A) 217 (B) 216 (C) 116 (D) 117
38. Sanjay went 70 metres in the East before turning to his right. He went 10 metres before turning to his right again and went 10 metres from this point. From here he went 90 metres to the North. How far was he from the starting point ?  
(A) 80 metres (B) 100 metres (C) 140 metres (D) 260 metres
39. If **RAT** = 42 and **CAT** = 57, then **LATE** = ?  
(A) 60 (B) 70 (C) 64 (D) 74

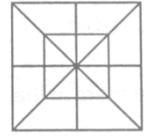
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**Direction 40:** Which sequence of letter when placed at the blanks one after the other will complete the given letter series ?

40. abc\_d\_bc\_d\_db\_cda  
(A) bacdc (B) cdabc (C) dacab (D) dccbd

41. Count the number of triangles and squares in the following figure ?  
(A) 28 triangles, 10 squares  
(B) 28 triangles, 8 squares  
(C) 32 triangles, 10 squares  
(D) 32 triangles, 8 squares.



**Direction 42 :** Six friends are sitting around a circular table at equal distances from each other. Ramola is sitting two places right of Komolika who is exactly opposite to Anu. Anu is sitting on the immediate left of Pallavi, who is exactly opposite to Mandira, natasha is also sitting at the table.

42. Which of the following statements is not correct ?  
(A) Natasha and Ramola are exactly opposite to each other.  
(B) Mandira and Natasha are at equal distance from Komolika.  
(C) Angle subtended by Manidra and Natasha is same at the angle subtended by Ramola and Pallavi at the centre of the table.  
(D) Natasha is on the immediate left of Pallavi.

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*Space for Rough Work*

43. Three persons **A**, **B** and **C** are Standing in a queue. There are five persons between **A** and **B** and eight persons between **B** and **C**. If there be three persons ahead of **C** and **21** persons behind **A**, what could be the minimum number of persons in the queue.  
(A) 41                      (B) 40                      (C) 28                      (D) 27

**Direction 44 :** Find the Odd one Out:

44. (A) 9 – 27    (B) 15 – 45  
(C) 10 – 30    (D) 20 – 60
45. It being given that : > denotes +, < denotes -, + denotes ÷, - denotes =, = denotes 'less than' and × denotes 'greater than', find which of the following is a correct statement.  
(A)  $3 + 2 < 4 = 9 + 3 < 1$     (B)  $3 > 2 > 4 = 18 + 3 < 2$   
(C)  $3 > 2 < 4 \times 8 + 4 < 2$     (D)  $3 + 2 < 4 \times 9 + 3 < 3$

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**12<sup>TH</sup> CLASS (Medical) TEST ID: 91226****ANSWERS**

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1.	(B)	2.	(A)	3.	(D)	4.	(D)	5.	(D)
6.	(D)	7.	(C)	8.	(C)	9.	(A)	10.	(C)
11.	(B)	12.	(C)	13.	(D)	14.	(C)	15.	(B)
16.	(C)	17.	(A)	18.	(D)	19.	(A)	20.	(C)
21.	(B)	22.	(A)	23.	(D)	24.	(C)	25.	(B)
26.	(A)	27.	(A)	28.	(C)	29.	(B)	30.	(B)
31.	(A)	32.	(C)	33.	(A)	34.	(B)	35.	(B)
36.	(A)	37.	(C)	38.	(B)	39.	(B)	40.	(C)
41.	(C)	42.	(D)	43.	(C)	44.	(A)	45.	(C)