

STaRT-2012

SAMPLE TEST PAPER

CLASS-XII (SC.-BIOLOGY)

Time : 90 min.

Maximum Marks : 200

GENERAL INSTRUCTIONS

1. The question paper contains 50 questions, 15 questions from Physics (1-15), 10 questions from Chemistry (16-25), 15 Questions from Biology (26-40) and 10 questions from Mental Ability (41-50).
2. The OMR sheet given in the examination hall is the Answer Sheet.
3. Blank papers, clip boards, log tables, slide rule, calculators, mobile or any other electronic gadgets in any form is not allowed.
4. Do not forget to mention your roll number neatly and clearly in the blank space provided in the answer sheet.
5. Each Question carries 4 marks. '1' mark will be deduct for each wrong answer. So attempt each question carefully.
6. No rough sheets will be provided by the invigilators. All the rough work is to be done in the blank space provided in the question paper.
7. In case of any dispute, the answer filled in the OMR sheet available with the institute shall be final.

Name : _____ Roll No. : _____

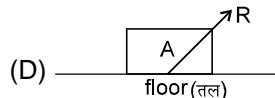
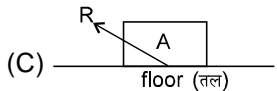
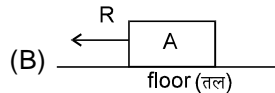
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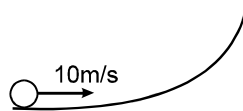
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1. At $t = 0$ a particle at $(1, 0, 0)$ moves towards $(4, 4, 12)$ with a constant velocity of magnitude of 65m/s . The position of the particle is measured in metre and time in second. The position of the particle at $t = 2\text{ s}$ is:
- (A) $(13\hat{i} - 120\hat{j} + 40\hat{k})\text{ m}$ (B) $(40\hat{i} + 31\hat{j} - 120\hat{k})\text{ m}$
 (C) $(16\hat{i} + 20\hat{j} + 60\hat{k})\text{ m}$ (D) $(31\hat{i} + 40\hat{j} + 120\hat{k})\text{ m}$
2. What is the angle between $\hat{i} + \hat{j} + \hat{k}$ & \hat{i} :
- (A) $\frac{\pi}{6}$ (B) $\frac{\pi}{4}$ (C) $\frac{\pi}{3}$ (D) none
3. A particle is moving in a circle :
- (A) The resultant force on the particle must be towards the centre.
 (B) The resultant force may be towards the centre.
 (C) The direction of the angular acceleration and the angular velocity must be same.
 (D) The cross product of the tangential acceleration and the angular velocity will be zero.
4. A parallel beam of particles of mass 'm' moving with velocity 'v' impinges on a wall at an angle θ to its normal. The number of particles per unit volume in the beam is 'n'. If the collision of particles with the wall is elastic, then the pressure exerted by this beam on the wall is :
- (A) $2 mn v^2 \cos \theta$ (B) $2 mn v^2 \cos^2 \theta$ (C) $2 mn v \cos \theta$ (D) $2 mn v \cos^2 \theta$
5. A box 'A' is lying on the horizontal floor of the compartment of a train running along horizontal rails from left to right. At time 't', it decelerates. Then the reaction R by the floor on the box is given best by :



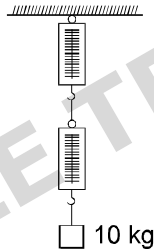
6. A force $\vec{F} = 6\hat{i} - 8\hat{j} + 10\hat{k}$ N produces acceleration 1 m/s^2 in a body. The mass of the body is (in kg) :
- (A) $6\hat{i} - 8\hat{j} + 10\hat{k}$ (B) $10\sqrt{2}$ (C) 100 (D) 10
7. A ring rolls without sliding on a horizontal surface with a velocity of 10 m/s . It ascends a smooth continuous track as shown in the figure. The height upto which it will ascend is :



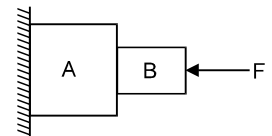
- (A) 10m (B) 5m (C) 20m (D) 5/2m

Space For Rough Work

8. The equation of motion of a particle having mass 1 g is $\frac{d^2x}{dt^2} + \pi^2x = 0$, where x is displacement (in m) from mean position. The frequency of oscillation is (in Hz) :
- (A) $\frac{1}{2}$ (B) 2 (C) $5\sqrt{10}$ (D) $\frac{1}{5\sqrt{10}}$
9. A body of mass 2 kg is moving under the influence of a central force whose potential energy is given by $U(r) = 2r^3$ J. If the body is moving in a circular orbit having radius 5m, its energy will be :
- (A) 625 J (B) 250 J (C) 500 J (D) 125 J
10. Work done by all the forces on a system of particles is equal to :
- (A) Change in kinetic energy of the system
(B) Change in potential energy of the system
(C) Change in total energy of the system
(D) Change in kinetic energy only if the forces acting are conservative.
11. A block of mass 10 kg is suspended through two light spring balances as shown in figure.



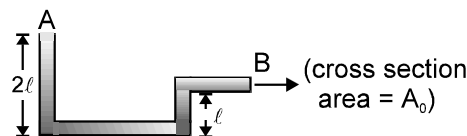
- (A) Both the spring balances will read 10 kg.
(B) Both the spring balances will read 5 kg.
(C) The upper spring balance will read 10 kg and the lower spring balance will read zero.
(D) The individual readings of spring balances may be anything but their sum will be 10 kg.
12. Consider the situation as shown in the figure. The wall is smooth but the surface of A and B in contact are rough. The friction on B due to A in equilibrium state of the system :
- (A) is upward (B) is downward
(C) is zero (D) the system cannot remain in equilibrium.



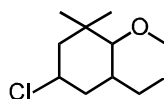
13. Two semi circular rings of uniform linear mass densities λ and 2λ of radius 'R' each are joined to form a complete ring. The distance of the center of mass of complete ring from its geometrical centre is :
- (A) $\frac{3R}{8\pi}$ (B) $\frac{2R}{3\pi}$ (C) $\frac{3R}{4\pi}$ (D) none of these

Space For Rough Work

14. A tube in vertical plane is shown in figure. It is filled with a liquid of density ρ and its end B is closed. Then the force exerted by the fluid on the tube at end B will be : [Neglect atmospheric pressure and assume the radius of the tube to be negligible in comparison to ℓ]
- (A) 0
(B) $2\rho g\ell A_0$
(C) $\rho g\ell A_0$
(D) Cannot be determined



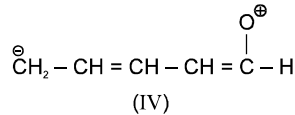
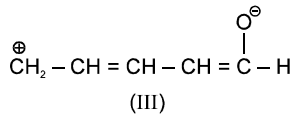
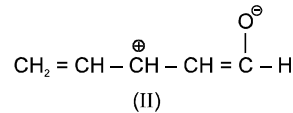
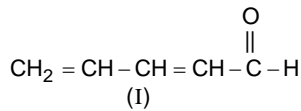
15. An electromagnetic wave travelling through a transparent medium is given by $E_x(y,t) = E_{ox} \sin 2\pi \left[\frac{y}{5 \times 10^{-7}} - 3 \times 10^{14} t \right]$ in SI unit then the refractive index of medium is :
- (A) 1.2 (B) 1.50 (C) 1.33 (D) 2
16. Which of the following has maximum ionization potential :
(A) Be (B) K (C) Na (D) Mg
17. If ΔE° is heat of reaction for combustion of ethanol (liquid) at constant volume at 298 K, then heat of reaction at constant pressure, ΔH° will be :
(A) $\Delta H^\circ = \Delta E^\circ - RT$ (B) $\Delta H^\circ = \Delta E^\circ + RT$ (C) $\Delta H^\circ = \Delta E^\circ + 2RT$ (D) $\Delta H^\circ = \Delta E^\circ - 2RT$
18. Which of the following are isostructural :
(A) $\text{XeF}_2, \text{IF}_2^-$ (B) NH_3, BF_3 (C) $\text{CO}_3^{2-}, \text{SO}_3^{2-}$ (D) $\text{PCl}_5, \text{ICl}_5$
19. 5 mole of SO_2 and 5 moles of O_2 are allowed to react to form SO_3 in a closed vessel. At the equilibrium stage 60% of SO_2 is used up. The total number of moles of SO_2, O_2 and SO_3 in the vessel now is :
(A) 8 (B) 6.5 (C) 9.5 (D) 8.5
20. In which of the following minerals aluminium is not present :
(A) Cryolite (B) Mica (C) Fledspar (D) flourspar
21. In a closed insulated container, a liquid is stirred with a paddle to increase the temperature. Which of the following is true ?
(A) $\Delta E \neq 0, W \neq 0, q = 0$ (B) $\Delta E = 0, W \neq 0, q \neq 0$
(C) $\Delta E \neq 0, W = 0, q \neq 0$ (D) $\Delta E = q = 0, W \neq 0$
22. The correct IUPAC name of the following compound is :



- (A) Methyl 4-chloro-2-ethyl-5, 5-dimethylcyclohexanol
(B) 1, 1-Dimethyl-2-methoxy-3-ethyl-5-chlorocyclohexane
(C) 5-Chloro-3-ethyl-2-methoxy-1, 1-dimethylcyclohexane
(D) 1-Chloro-5-ethyl-4-methoxy-3, 3-dimethylcyclohexanol

Space For Rough Work

23. The correct stability order of the given resonating structures is :



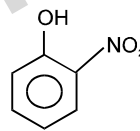
- (A) III > II > IV > I
(B) I > III > II > IV
(C) I > II > III > IV
(D) IV > III > II > I
24. The product of following reaction is $\text{H} - \text{C} \equiv \text{C} - \text{H} + \text{CH}_3\text{COOH} \xrightarrow{\text{Hg}^{+2}, 353\text{K}}$
- (A) Acetone
(B) Acetaldehyde
(C) Vinyl ethanoate
(D) Ethyl ethanoate
25. The correct boiling point order of following compounds is :



I



II



III

- (A) III > II > I
(B) I > II > III
(C) II > III > I
(D) II > I > III

26. The vital morphological and physiological units of a mammalian kidney are
- (A) ureters
(B) nephridia
(C) uriniferous tubules
(D) Seminiferous tubules

27. Smallest cell is
- (A) Mycoplasma (B) Bacteria (C) Chlamydomonas (D) Amoeba

28. Crossing over occurs during
- (A) Leptotene (B) Pachytene (C) Diplotene (D) Diakinesis

29. When subjected to thyroidectomy a tadpole of frog will:
- (A) grow into giant frog
(B) remain tadpole throughout life
(C) turn into a dwarf frog
(D) die immediately

30. The pacemaker of heart is :
- (A) AV node (B) SA node (C) SV node (D) Tricuspid valve

Space For Rough Work



31. In adult man, normal BP is:
(A) 100/80 mm Hg (B) 120/80 mm Hg (C) 100/120 mm Hg (D) 80/120 mm Hg
32. The first carbon dioxide acceptor in C_4 -plant is
(A) Phosphoenol-pyruvate (B) Ribulose 1, 5-diphosphate
(C) Oxalo-acetic acid (D) Phosphoglyceric acid
33. The ripening of fruits can be hastened by treatment with
(A) Ethylene gas (B) Gibberellin (C) IAA (D) Florigen
34. Match the column-I with appropriate items of column-II
- | | |
|---------------------------------------|--------------------------|
| Column-I | Column-II |
| (a) Stomata | (i) Ascent of sap |
| (b) Hydathode | (ii) Absorption of water |
| (c) Root hair | (iii) Transpiration |
| (d) Xylem vessel | (iv) Guttation |
| (e) Subsidiary cell | (v) K^+ |
| (A) a – iii b – iv c – v d – i e – ii | |
| (B) a – i b – ii c – iii d – iv e – v | |
| (C) a – iii b – v c – iv d – i e – ii | |
| (D) a – iii b – iv c – ii d – i e – v | |
35. Bryophyllum is a classical exmple of vegetative propagation by
(A) Leaves (B) Flower buds (C) Roots (D) Tuber
36. Urea is produced from ammonia in the body of rabbit or man in-
(A) Liver (B) Kidneys (C) Urinary bladder (D) Blood
37. The hormone that promotes reabsorption of water from glomerular filtrate is-
(A) Oxytocin (B) Vasopressin (C) Calcitonin (D) Relaxin
38. Which element facilitates translocation of sugars in plants
(A) Zn (B) K (C) B (D) Mo
39. Vivipary means
(A) Fruits are not formed (B) Germination of seed on mother plant
(C) Formation of fruits directly by embryo (D) Production of fruitless plant
40. The floral formula, $Br \oplus \underset{\text{♀}}{\overset{\text{♂}}{\text{C}}} \underset{3+3}{\text{P}} \underset{3+3}{\text{A}} \underset{(3)}{\text{G}}$ belongs to family
(A) Liliaceae (B) Fabaceae (C) Solanceae (D) Cruciferae

Space For Rough Work

Directions : (41 to 43) Find the missing term :

41. 1, 3, 7, 25, 103, ?
(A) 526 (B*) 521 (C) 515 (D) 509
42. ABCA, BCDB, CDEC, DEFD, ?
(A) EFHE (B) FEGF (C) EFGF (D*) EFGE

- 43.
- | | | |
|----|----|-----|
| 1 | 7 | 6 |
| 3 | 3 | ? |
| 5 | 4 | 8 |
| 35 | 74 | 104 |
- (A) 1 (B) 2 (C) 3 (D) 4

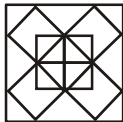
Directions : (44 to 45) Assume the following :

- 'A @ B' means 'A is greater than B' ;
'A • B' means 'A is either greater than or equal to B' ;
'A \$ B' means 'A is equal to B' ;
'A * B' means 'A is smaller than B' ;
'A # B' means 'A is either smaller than or equal to B' ;

In each question, two statements followed by two conclusions I and II are given. Assuming the statement to be true, state which of the conclusions I and II is / are definitely true ?

Give answer (A) if only conclusion I is true; (B) if only conclusion II is true; (C) if either I or II is true; and (D) if both I and II are true.

44. **Statements** : P # Q, M • N \$ P
Conclusions : I. M @ P II. N # Q
45. **Statements** : L • M, R • T \$ L
Conclusions : I. T • M II. R @ L
46. How many squares does the figure have ?



- (A) 10 (B*) 11

Space For Rough Work



- (C) 12 (D) 14
47. Introducing a girl, Vipin said, "Her mother is the only daughter of my mother – in – law. "How is Vipin related to the girl ?
(A) Uncle (B*) Father (C) Brother (D) Husband
48. Ram is to the South-East of Mukesh, Shyam is to the East of Mukesh and North-East of Ram. If Suresh is to the North of Ram and North-West of Shyam, in which direction of Mukesh is Suresh located ?
(A) North-West (B) South-West (C*) North-East (D) South-East

Directions : (49 to 50) Fill the blanks in the following questions from the choice given below. Which are based on pyramids.

a
b c d
e f g h i
j k l m n o p
q r s t u v w x y
z

49. elu : adi :: ? : abe
(A) fmv (B) dgl (C) hmt (D*) inu
50. flt : klm :: iow : ?
(A) hnv (B) mno (C*) nop (D) gmu

ANSWER

- | | | | | | | | |
|---------|---------|---------|---------|---------|---------|---------|---------|
| 1. (D) | 2. (D) | 3. (B) | 4. (B) | 5. (C) | 6. (B) | 7. (B) | 8. (A) |
| 9. (A) | 10. (A) | 11. (A) | 12. (D) | 13. (B) | 14. (C) | 15. (D) | 16. (A) |
| 17. (A) | 18. (A) | 19. (D) | 20. (D) | 21. (A) | 22. (C) | 23. (B) | 24. (C) |
| 25. (C) | 26. (C) | 27. (A) | 28. (B) | 29. (B) | 30. (B) | 31. (B) | 32. (A) |
| 33. (A) | 34. (D) | 35. (A) | 36. (A) | 37. (B) | 38. (C) | 39. (B) | 40. (A) |
| 41. (B) | 42. (D) | 43. (B) | 44. (B) | 45. (A) | 46. (B) | 47. (B) | 48. (C) |
| 49. (D) | 50. (C) | | | | | | |