

**TALENT SEARCH EXAM****INSTRUCTIONS**

1. Immediately fill in the particulars on this page of the Test Booklet with Blue/Black Ball Point Pen. Use of pencil is strictly prohibited.
2. Test duration is ONE HOUR (60MINUTES)
3. The Test Booklet consists of 40 questions of 4 marks each. The maximum marks are 160.
4. There are four sections in the question paper.
The distribution of questions, subject wise in each part is mentioned below:-

PHYSICS	– 10 Questions
CHEMISTRY	– 10 Questions
MATHEMATICS/BIOLOGY	– 10 Questions
MENTAL ABILITY	– 10 Questions
5. Candidates will be awarded Four marks (+4) each for indicated correct response of each Question & One mark (-1) will be deducted for indicated incorrect response. There will be No deduction from the total score if no response is indicated.
6. No candidate is allowed to carry any textual material, printed or written, bits of paper, mobile phone, any electronic device etc.
7. After the completion of the test, the candidate must hand over the Answer Sheet to the Invigilator On duty in the Room/Hall. However, the candidates are allowed to take away this Test Booklet with them.
8. Do not fold or make any stray marks on the Answer sheet.

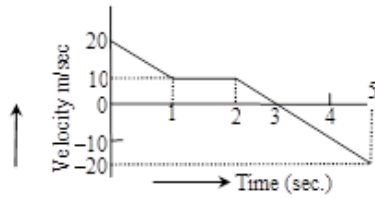
Name : _____ Class : _____ Roll No. _____



PHYSICS

1. In the S.I. system the unit of energy is-
- (a) erg
(b) calorie
(c) joule
(d) electron volt

2. From figure the distance travelled in 5 second is -



- (a) 10m
(b) 30m
(c) 50m
(d) 0 m
3. A car travels first $\frac{1}{3}$ rd of the distance AB at 30 km/hr, next $\frac{1}{3}$ rd of the distance at 40 km/hr, last $\frac{1}{3}$ of the distance at 24 km/hr. Its average speed in km/hr for the whole journey is -
- (a) 40
(b) 35
(c) 30
(d) 28

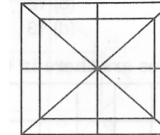
4. A body is thrown upward and reaches its maximum height. At that position-
- (a) its velocity is zero and its acceleration is also zero
(b) its velocity is zero but its acceleration is maximum
(c) its acceleration is minimum
(d) its velocity is zero and its acceleration is the acceleration due to gravity

5. Two quantities whose dimensions are not same, cannot be-
- (a) multiplied with each other
(b) divided
(c) added or subtracted in the same expression
(d) None of these

6. If $x = at + bt^2$, where x is in metre and t in hour (hr), then unit of b will be-
- (a) m^2/hr
(b) m

36. If $(a * b)$ stands for $(a + b)^2$ and $(a \oplus b)$ stands for $(a - b)^2$, then the value of $(a * b) + (a \oplus b)$ is
- (a) $2a^2 + b^2$
(b) $a^2 + 2b^2$
(c) $2(a^2 + b^2)$
(d) None of these

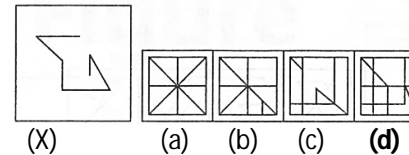
37. How many triangles are there in the following figure?



- (a) 16
(b) 24
(c) 28
(d) 32

38. In the given question, you are given a figure (X) followed by four figures (a), (b), (c) and (d) such that (X) is embedded in one of them. Trace out the correct alternative.

Problem Figure Answer Figure



- (X) (a) (b) (c) **(d)**
39. In these question, a problem figure is given on the left side of the

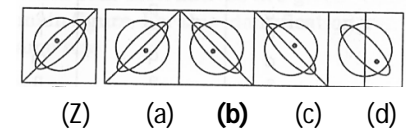
line, which is incomplete. One out of the four answer figures (a), (b), (c) and (d) can complete the same. You have to locate the answer figure which is inserted in the problem figure, without changing the direction, complete the same.

Problem Figure Answer Figure



- (a) (b) **(c)** (d)

40. In the following question, choose the correct water image of the figure(Z) from amongst the four alternative (a), (b), (c) and (d) given below with it.



- (Z) (a) **(b)** (c) (d)

- (a) 72
- (b) 78**
- (c) 42
- (d) none of these

29. In the expansion of $(1 + x)^{15}$, the coefficients of $(2r+3)^{th}$ and $(r-1)^{th}$ terms are equal, then the value of r is
(a) 5
 (b) 6
 (c) 4
 (d) 3

30. The 10th common term between the A.P.s 3, 7, 11, 15,...and 1, 6, 11, 16,...is
(a) 191
 (b) 193
 (c) 211
 (d) none of these

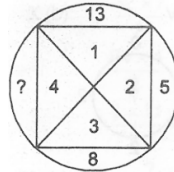
MENTAL ABILITY

31. In a certain code language, 'MAN' is coded as 'NBO', then in the same code language 'TUL' will be written as
 (a) UVP
 (b) UWN
(c) UVM
 (d) UMW

32. *YEB, WFD, UHG, SKI?*
(a) QOL
 (b) QGL
 (c) TOL
 (d) QNL

33. Pointing to a man, Radhika said, "His sister is my daughter's brother's mother". How is the man related to Radhika?
(a) Brother
 (b) Father
 (c) Uncle
 (d) Grandfather

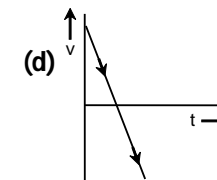
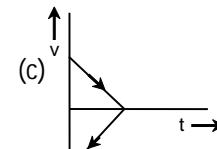
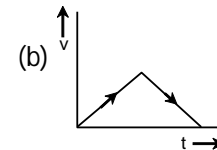
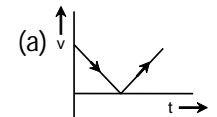
34. Insert the missing number or letter from among the given alternative.
 (a) 10
 (b) 11
(c) 12
 (d) 13



35. In a class of 36 students, the rank of Nitesh is 18th from the top. What will be his rank from bottom?
(a) 19th
 (b) 17th
 (c) 18th
 (d) 20th

- (c) m/hr
- (d) m/hr²**

7. A body is thrown vertically upwards. Which one of the following graphs correctly represent the velocity vs time ?



8. A particle is projected under gravity at an angle

of projection 45°. If for ground to ground projectile motion its range is 36 m. Then maximum Height attained by particle.
 (a) 6 m
(b) 9 m
 (c) 5 m
 (d) 8 m

9. We can derive Newton's-
 (a) second and third laws from the first law
 (b) first and second laws from the third law
(c) third and first laws from the second law
 (d) All the three laws are independent of each others

10. Two projectiles of same mass and with same velocity are thrown at an angle 60° and 30° with the horizontal, then which will remain same
 (a) Time of flight
(b) Range of projectile
 (c) Max height acquired
 (d) None of these

CHEMISTRY

11. The volume occupied by 14g of nitrogen at N. T. P. is values of m and n are respectively
(a) 22.4 L
(b) 11.2 L
(c) 44.8 L
(d) 5.6 L
12. The limiting line in Paschen series corresponds to
(a) $n_1 = 3, n_2 = 4$ (b) $n_1 = 3, n_2 = 3$
(c) $n_1 = 3, n_2 = 10$
(d) $n_1 = 3, n_2 = \infty$
13. The process requiring the absorption of energy is
(a) $F \rightarrow F^-$
(b) $Cl \rightarrow Cl^-$
(c) $O \rightarrow O^-$
(d) $H \rightarrow H^-$
14. How many σ and π bonds are in $CH_2=CH_2$?
(a) 4 σ and 2 π bonds
(b) 6 σ and 0 π bonds
(c) 5 σ and 1 π bonds
(d) None of these
15. The bond length in the species O_2, O_2^+ and O_2^- is in the order
(a) $O_2^+ > O_2 > O_2^-$
(b) $O_2^+ > O_2^- > O_2$
(c) $O_2 > O_2^+ > O_2^-$
(d) $O_2^- > O_2 > O_2^+$
16. One atmosphere is numerically equal to approximately
(a) 10^6 dynes cm^{-2}
(b) 10^2 dynes cm^{-2}
(c) 10^4 dynes cm^{-2}
(d) 10^8 dynes cm^{-2}
17. Which of the following statement is correct if intermolecular forces in liquids A, B and C are in the order $A < B < C$?
(a) B evaporates more readily than A
(b) B evaporates more readily than A
(c) A and B evaporates at the same rate.
(d) A evaporates more readily than C.
18. Considering entropy (S) as a thermodynamic parameter, the criterion for the
(a) 4, 7
(b) 7, 4
(c) 4, 4
(d) 7, 7
22. If $A = \{1, 2, 3, 4\}$. The number of elements in the power set of A is
(a) 8
(b) 7
(c) 15
(d) 16
23. The value of $\cos 52^\circ + \cos 68^\circ + \cos 172^\circ$ is
(a) 0
(b) 1
(c) 2
(d) $3/2$
24. $\sin^6 A + \cos^6 A + 3\sin^2 A \cos^2 A =$
(a) 0
(b) 1
(c) 2
(d) 3
25. If $z = \frac{1}{(1-i)(2+3i)}$, then $|z| =$
(a) 1
(b) $\frac{1}{\sqrt{26}}$
- (c) $\frac{5}{\sqrt{26}}$
(d) none of these
26. If α, β are roots of the equation $4x^2 + 3x + 7 = 0$, then $\frac{1}{\alpha} + \frac{1}{\beta}$ is equal to
(a) $7/3$
(b) $-7/3$
(c) $3/7$
(d) $-3/7$
27. The length of a rectangle is three times the breadth. If the minimum perimeter of the rectangle is 160cm, then
(a) breadth > 20 cm
(b) length < 20 cm
(c) breadth ≥ 20 cm
(d) length ≤ 20 cm
28. There are 13 players of cricket, out of which 4 are bowlers. In how many ways a team of eleven be selected from them so as to include at least two bowlers?

D.	Diplotene	(iv)	Chromosomes becomes gradually visible
E.	Diakinesis	(v)	Crossing over

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

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

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

(d) A-(iii), B-(iv), C-(v), D-(ii), E-(i).

29. Match the animals in Column I with their character or common name in Column II.

	Column I		Column II
(A)	Loligo	(i)	Mosquitoes
(B)	Octopus	(ii)	Cuttlefish
(C)	Limulus	(iii)	Devil fish
(D)	Aedes	(iv)	Squid
(E)	Sepia	(v)	Living fossil

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

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

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

(d) A-(iii), B-(v), C-(ii), D-(iv), E-(i).

30. Match the following columns:

	Column I		Column II
(A)	Tap root	(i)	Sweet potato
(B)	Adventitious root	(ii)	Turnip
(C)	Stem	(iii)	Wheat
(D)	Fibrous root	(iv)	Potato

Codes:

	A	B	C	D
(a)	i	ii	iii	iv
(b)	ii	iii	i	iv
(c)	ii	i	iv	iii
(d)	ii	iii	iv	i.

MATHEMATICS

21. Two finite sets have m and n elements. The number of subsets of the first set is 112 more than that of the second. The values of m and n are respectively spontaneity of any process is

- (a) $\Delta S_{system} + \Delta S_{surroundings} > 0$
 (b) $\Delta S_{system} - \Delta S_{surroundings} > 0$
 (c) $\Delta S_{system} > 0$
 (d) $\Delta S_{surroundings} > 0$ only

19. Oxidation number of Cr in $\text{Cr}(\text{CO})_6$ is
 (a) - 2
 (b) + 2
 (c) + 6
(d) 0

20. For a weak acid HA the percentage dissociation is nearly 11 at equilibrium of concentration of acid is 0.1 mol L^{-1} then correct option for its 'Ka' at same temperature is
 (a) 1×10^{-4}
 (b) 1×10^{-6}
(c) 1×10^{-5}
 (d) 1×10^{-3}

BIOLOGY

21. Match the entities in Column I with Column II:

	Column I		Column II
(A)	Primata	(i)	Dog
(B)	Diptera	(ii)	Wheat
(C)	Sapindales	(iii)	Mango
(D)	Poales	(iv)	House fly
(E)	Carnivore	(v)	Man

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

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

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

(d) A-(ii), B-(iii), C-(i), D-(iv), E-(v).

22. Identify the true statements for viroids.
 (i) In 1971, T.O. Diener discovered it and was smaller than viruses
 (ii) It was found to be a free RNA; it lacked the protein coat

(iii) The RNA of the viroid was of high molecular weight
 (iv) Caused potato spindle tuber disease.
 (a) (i) and (iii)
(b) (i), (ii) and (iv)
 (c) (i), (ii), (iii) and (iv)
 (d) Only (iii).

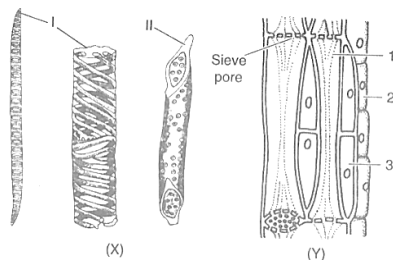
23. Which one is more specific for sexual reproduction in bryophytes?
 (a) Male and female sex organs are produced on the same thalli
 (b) Male and female sex organs are produced on the different thalli
(c) Male and female sex organs are produced either on the same or on different thalli
 (d) None of the above.

24. Which one of the following sets of animals belongs to the same class of a phylum?
 (a) Hydra, jelly fish, cray fish
 (b) Bat, pigeon, whale
 (c) Spider, scorpion, centipede

(d) Whale, otter, kangaroo.

25. Member's of Liliaceae family are:
 (a) Gram, arhar, sem, moong
 (b) Soyabean, groundnut, dye (Indigofera), sunhamp
 (c) Sweet pea, mulathi, trifolium, sesbania
(d) Tulip, Aloe, Asparagus, colchicum autumnales.

26. Identify given diagrams X, Y and choose the correct answer for labelled part I, II, 1, 2 and 3 of given diagrams.



(a) (X)-Xylem-I- Vessel, II- Tracheid
 (Y)-Phloem-1-Sieve tube elements, 2- Phloem

parenchyma, 3- Companion cell
 (b) (X)-Xylem-I- Tracheid, II- Vessel
 (Y)-Phloem-1- parenchyma, 2- Sieve tube elements, 3- Companion cell
 (c) (X)-Xylem-I-Fibre, II- Tracheid, (Y)-Phloem-1-Sieve tube elements, 2-Phloem parenchyma, 3- Companion cell
(d) (X)-Xylem-I- Tracheid, II- Vessel (Y)-Phloem-1-Sieve tube elements, 2-Phloem parenchyma, 3- Companion cell

27. The (i) _____ is made of a single thin layer of flattened cells with irregular boundaries, they are found in the walls of (ii) _____. The (iii) _____ is composed of a single layer of cube like cells found in the (iv) _____.

(a) (i) Squamous epithelium (ii) Blood

vessels and sacs of lungs (iii) Cuboidal epithelium (iv) Ducts of glands and nephron of kidney

(b) (i) Cuboidal epithelium (ii) Squamous epithelium (iii) Ducts of starons and nephron of kidney (iv) Blood vessels and sacs of lungs
 (c) (i) Ciliated epithelium (ii) Heart (iii) Straitified epithelium (iv) Alveoli of lungs
 (d) (i) Columnar epithelium (ii) Blood vessels and sacs of the lungs (iii) Cuboidal epithelium (iv) Testis and ovary.

28. Match the entities in Column I with their character in Column II regarding cell cycle:

Column I		Column II
Leptotene	(i)	Terminalisat ion of chiasmata
Zygotene	(ii)	Formation chiasmata
Pachytene	(iii)	Synapsis