

# MOTION OPEN SCHOLARSHIP TEST

## SESSION - 2020-21

**MOVING CLASS : 10<sup>th</sup>**

**SAMPLE PAPER**

CANDIDATE'S NAME : \_\_\_\_\_

**DURATION: 90 MINUTES**

**TOTAL QUESTIONS: 60**

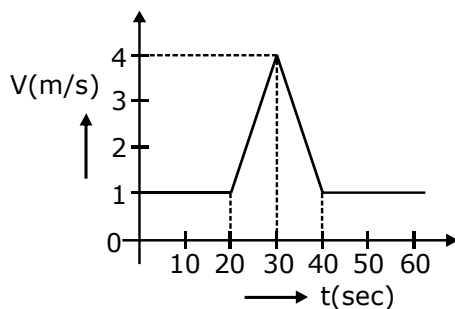
**MAXIMUM MARKS : 120**

**INSTRUCTION:**

- The paper consists of Five sections :- Science (30 Questions), Mathematics (10 Questions), Social Studies (10 Questions), English (5 Questions) and Mental ability (5 Questions).
- All questions are compulsory and carry 2 marks each.
- There is only one correct answer hence mark one choice only.
- Darken your choice in OMR Sheet with Blue/ Black Ball Point Pen.
- Return the OMR Sheet to the invigilator at the end of the exam.

**SCIENCE**

- Velocity-time (v-t) graph for a moving object is shown in figure. Total displacement of the object during the time interval when there is non-zero acceleration and retardation is:



- (A) 60m (B) 50m  
(C) 30m (D) 40m
- A particle moving in a straight line covers half the distance with speed of 3 m/s. The other half of the distance is covered in two equal time intervals with speed of 4.5 m/s and 7.5 m/s respectively. The average speed of the particle during this motion is:  
(A) 4.0 m/s (B) 5.0 m/s  
(C) 5.5 m/s (D) 4.8 m/s

- The potential energy of a freely falling object decreases continuously. What happens to the loss of potential energy?  
(A) It is continuously converted into sound energy  
(B) It is continuously converted into kinetic energy  
(C) It is continuously destroyed  
(D) None of these
- A body is just floating on the surface of a liquid. The density of the body is same as that of the liquid. The body is slightly pushed down. what will happen to the body?  
(A) It will slowly come back to its earlier position  
(B) It will remain submerged, where it is left  
(C) It will sink  
(D) It will come out violently
- A sound wave is travelling from east to west. In which direction do the molecules of the air vibrate ?  
(A) West-east (B) North - south  
(C) Up-down (D) None of these

6. A particle moves on a rough horizontal ground with some initial velocity  $v_0$ . If  $\left(\frac{3}{4}\right)^{\text{th}}$  of its kinetic energy is lost due to friction in time  $t_0$ , then coefficient of friction between the particle and the ground is:
- (A)  $\frac{v_0}{2gt_0}$  (B)  $\frac{v_0}{4gt_0}$   
(C)  $\frac{3v_0}{4gt_0}$  (D)  $\frac{v_0}{gt_0}$
7. The net force acting on a body of mass of 1 kg moving with a uniform velocity of  $5 \text{ ms}^{-1}$  is:
- (A) 5 N (B) 0.2 N  
(C) 0 N (D) None of these
8. A body of mass  $m$  is moving in a circle of radius  $r$  with a constant speed  $v$ . The force on the body is  $\frac{mv^2}{r}$  and is directed towards the centre. What is the work done by this force in moving the body over half the circumference of the circle?
- (A)  $\frac{mv^2}{\pi r^2}$  (B) Zero  
(C)  $\frac{mv^2}{r^2}$  (D)  $\frac{\pi r^2}{mv^2}$
9. On a rainy wet day, a thunder is heard 6 second after lightening. If speed of sounds is 350 m/s the altitude of the clouds is
- (A) 1.8 km (B) 1.9 m  
(C) 2.1 km (D) 2.5 km
10. An apple falls from a tree because of gravitational attraction between the earth and apple. If  $F_1$  is the magnitude of force exerted by the earth on the apple and  $F_2$  is the magnitude of force exerted by apple on earth, then
- (A)  $F_1$  is very much greater than  $F_2$   
(B)  $F_2$  is very much greater than  $F_1$   
(C)  $F_1$  is only a little greater than  $F_2$   
(D)  $F_1$  and  $F_2$  are equal
11. The standard room temperature is taken as
- (A)  $0^\circ\text{C}$  (B) 298 K  
(C) 273 K (D)  $20^\circ\text{C}$
12. Which of the following statements does not go with the liquid state?
- (A) Particles are loosely packed in the liquid state  
(B) Fluidity is maximum in the liquid state.  
(C) Liquids cannot be compressed much.  
(D) Liquids take up the shape of any container in which they are placed.
13. A mixture of common salt, sulphur, and iron filings is shaken with carbon disulphide and filtered through a filter paper. The filtrate is evaporated to dryness in a China dish. What will be left in the dish after evaporation?
- (A) Sand (B) Sulphur  
(C) Iron filings (D) Common salt
14. We can separate a pure solid from its solution by
- (A) crystallization (B) simple distillation  
(C) sedimentation (D) both (A) and (B)
15. The mass of a molecule of water is:
- (A)  $3 \times 10^{-26} \text{ kg}$  (B)  $3 \times 10^{-25} \text{ kg}$   
(C)  $1.5 \times 10^{-26} \text{ kg}$  (D)  $2.5 \times 10^{-26} \text{ kg}$
16. Chemical formula of ferric oxide is
- (A) FeO (B)  $\text{Fe}_2\text{O}_3$   
(C)  $\text{Fe}_3\text{O}_4$  (D) none of these
17. The atomic mass of calcium (Ca) is 40 g. The number of moles in 60 g of calcium are
- (A) 0.5 mol (B) 2.0 mol  
(C) 1.5 mol (D) 0.75 mol
18. Rutherford's experiment which established the nuclear model of the atom used a beam of
- (A)  $\beta$ -particles which impinged on the metal foil and got absorbed.  
(B)  $\gamma$ -rays which impinged on a metal foil and ejected electrons.  
(C) hydrogen atoms, which impinged on a metal foil and got scattered.  
(D)  $\alpha$ -particles nuclei, which impinged on a metal foil and got scattered.

- 19.** Which of the following shows the electronic configuration of  $\text{Ca}^{2+}$ ?  
 (A) He (B) Ne  
 (C) Ar (D) Xe
- 20.** Neutron is a fundamental particle which has:  
 (A) +1 unit charge and 1 unit mass  
 (B) No charge and 1 unit mass  
 (C) have no charge and mass  
 (D) have -1 unit charge and 1 unit mass
- 21.** Normally, in the process of osmosis the net flow of water molecules in or out of the cell depends upon differences in the:  
 (A) concentration of solute molecules inside and outside the cell  
 (B) concentration of enzymes on either side of the cell membrane  
 (C) rate of molecular motion on either side of the cell membrane  
 (D) rate of movement of insoluble molecules inside the cell
- 22.** Which of the following cell organelles liberate heat for the maintenance of constant body temperature in aves and mammals?  
 (A) Lysosomes  
 (B) Ribosomes  
 (C) Endoplasmic reticulum  
 (D) Mitochondria
- 23.** A long tree has several branches. The tissue that helps in the side ways conduction of water in the branches is:  
 (A) collenchyma (B) xylem parenchyma  
 (C) parenchyma (D) xylem vessels
- 24.** Which of the following cells is found in the cartilaginous tissue of the body?  
 (A) Mast cells (B) Basophils  
 (C) Osteocytes (D) Chondrocytes
- 25.** Diploblastic, aquatic animals with tissue grade of organization belong to the phylum:  
 (A) Protozoa (B) Porifera  
 (C) Cnidaria (D) Helminthes
- 26.** Binomial system of nomenclature means that every organism has:  
 (A) two names one scientific and the other popular  
 (B) one name given by two scientists  
 (C) one scientific name consisting of a generic and specific name  
 (D) an number in an international catalogue by which it can be identified
- 27.** Which of the following is a mismatch?  
 (A) AIDS - Bacterial infection  
 (B) Polio - Viral infection  
 (C) Malaria - Protozoan infection  
 (D) Elephantiasis - Helminth infection
- 28.** Which of the statements listed below is true about a common cold?  
 (A) Common cold is not contagious  
 (B) The common cold virus does not have its own RNA  
 (C) Common cold usually takes two months to clear up  
 (D) The common cold virus can leave the body through the mucus of infected people
- 29.** Some bacteria have the ability to 'fix' nitrogen. This means:  
 (A) they convert ammonia into nitrites and nitrates  
 (B) they break down useful nitrogen-rich compounds and release ammonium ions  
 (C) they convert nitrates into nitrogen gas  
 (D) they convert atmospheric nitrogen gas into biologically useful forms of nitrogen
- 30.** Ozone layer of atmosphere protects the living organism from:  
 (A) high temperature  
 (B) harmful radiations of sun  
 (C) hail and snow  
 (D) water pollution

**MATHS**

31. The king, queen and jack of clubs are removed from a deck of 52 cards and then well shuffled. One card is selected from the remaining cards. The probability of getting a club is \_\_\_\_\_ .

- (A)  $\frac{13}{49}$  (B)  $\frac{10}{49}$   
(C)  $\frac{3}{49}$  (D)  $\frac{1}{12}$

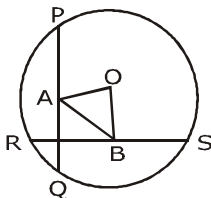
32. The mean of  $x_1 + x_2 + \dots + x_n$  is M. When  $x_i, i = 1, 2, \dots, 10$ , is replaced by  $x_i + 10$ , the mean is  $M_1$ , then

- (A) M (B) M + 10  
(C) 10 M (D) M + 100

33. Area of the base of a cone is  $25\pi \text{ cm}^2$  and its curved surface area is  $65\pi \text{ cm}^2$ . Find the volume of the cone.

- (A)  $300\pi \text{ cm}^2$  (B)  $200\pi \text{ cm}^2$   
(C)  $100\pi \text{ cm}^2$  (D)  $150\pi \text{ cm}^2$

34. In the figure, O is the center,  $PQ=RS$ , and A and B are the midpoints of PQ and RS, respectively. Which one is true?



- (A)  $\angle OBS = 90^\circ$  (B)  $\angle OAP = 90^\circ$   
(C)  $\angle OAB = \angle OBA$  (D) All of these

35. In a triangle ABC, D, E and F are mid-points of sides BC, AC and AB, respectively. If perimeter of  $\triangle DEF$  is 32 cm then perimeter of  $\triangle ABC$  is

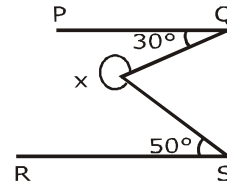
- (A) 16 cm (B) 32 cm  
(C) 64 cm (D) 48 cm

36. The perimeter of a rhombus is 100 cm and one of the diagonals is 40 cm. Then, the area of the rhombus in square centimeters is

- (A) 1200 (B) 300  
(C) 600 (D) 2500

37. Two sides of a triangle are of lengths 6 cm and 3 cm. The length of third side can be  
(A) 8 cm (B) 9 cm  
(C) 10 cm (D) 3 cm

38. In the figure, if  $PQ \parallel RS$ , then what is the value of x?



- (A)  $280^\circ$   
(B)  $80^\circ$   
(C)  $360^\circ$   
(D) cannot be terminated

39. Simplify  $\frac{x^3 - 3x^2}{9x^2 - x^4}$ .

- (A)  $\frac{1}{x+3}$  (B)  $\frac{-1}{x+3}$   
(C)  $\frac{1}{3x+3}$  (D)  $\frac{1}{3x-3}$

40. If  $x = 7 - 4\sqrt{3}$  then value of  $\sqrt{x} + \frac{1}{\sqrt{x}}$  is

- (A) 4 (B)  $2\sqrt{3}$   
(C)  $\sqrt{3}$  (D) 2

**SOCIAL SCIENCE**

41. The book 'Two Treatise of the Government' was written by :

- (A) Rousseau (B) John Locke  
(C) Montesquieu (D) Karl Marx

42. When did Economic Depression occur in U.S.A. ?

- (A) 1926 (B) 1927  
(C) 1928 (D) 1929

43. Sri Lanka is separated from India by a narrow channel of sea called:

- (A) Gulf of Kachchh  
(B) Palk Strait  
(C) Colombo Gulf  
(D) Gulf of Khambhat

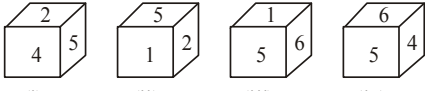
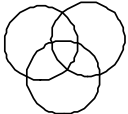
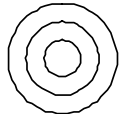


44. The only large river of Rajasthan is :  
(A) Luni (B) Teesta  
(C) Satluj (D) Dihang
45. The area drained by a single-river system is called:  
(A) Water divide (B) Drainage basin  
(C) Valleys (D) River basin
46. Apartheid was the name of a system of \_\_\_\_\_ unique to South Africa.  
(A) Economic discrimination  
(B) Social discrimination  
(C) Racial discrimination  
(D) Political discrimination
47. Who is the Chairman of Planning Commission in India ?  
(A) President (B) Prime Minister  
(C) Planning Minister (D) Vice-President
48. Jowar and Bajra are:  
(A) Kharif crops (B) Rabi crops  
(C) Zaid crops (D) All of these
49. The full form of GNP is :  
(A) Gross National Product  
(B) Green Nation People  
(C) Green National Project  
(D) Gross National Performance
50. Slogan of 'Garibi Hatao' was given by the  
(A) Janta Party (B) Congress  
(C) Left Front (D) Telegu Desam

**ENGLISH**

51. That is Antonio, the duke's \_\_\_\_\_ son.  
(A) oldest (B) eldest  
(C) older (D) old
52. This is the \_\_\_\_\_ Institute to my house.  
(A) Further (B) Farther  
(C) Nearest (D) Next
53. \_\_\_\_\_ tourists come to visit India during holidays.  
(A) Much (B) Many  
(C) Some (D) Any

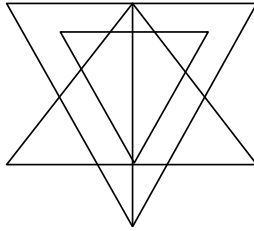
54. The population of India is \_\_\_\_\_ than the U.S.A.  
(A) great (B) greatest  
(C) greater (D) greater
55. Work hard \_\_\_\_\_ you will not pass.  
(A) otherwise (B) while  
(C) therefore (D) because

**MENTAL ABILITY**

56. Find the missing term.  
36, 157, 301, 470, ?, 891  
(A) 646 (B) 695  
(C) 666 (D) 669
57.   
(i) (ii) (iii) (iv)  
Which number is opposite to number 1 ?  
(A) 4 (B) 6  
(C) 2 (D) 3
58. Authors, Teachers, Men -  
(A)  (B)   
(C)  (D) 

59. **Statements :**  
All lamps are books  
No book is coloured  
**Conclusions :**  
I. Some lamps are coloured.  
II. No lamps is coloured.  
(A) Only (I) follows  
(B) Only (II) follows  
(C) Both (I) and (II) follows  
(D) Neither (I) or nor (II) follows

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



(A) 27  
(C) 21

(B) 23  
(D) 25

**ROUGH WORK**