

# JEE EXPERT

## SAMPLE PAPER

SCIENCE

Going to IX

Time : 2 Hours

Maximum Marks : 234

Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.

### INSTRUCTIONS

- (i) The question paper has 8 printed pages excluding Answer Sheet. Please ensure that the copy of the question paper you have received contains all pages.
- (ii) The question paper contains 78 questions. Each question carry 3 marks and all the questions are compulsory. **There is negative marking. One mark will be deducted for each wrong answer. No mark will be deducted for unattempted question.**
- (iii) Each question contains Four alternatives out of which only **ONE** is correct.
- (iv) Indicate the correct answer for each question by filling appropriate bubble in your answer sheet.
- (v) For rough work, use the space provided in question paper booklet. No extra sheet will be provided for rough work.
- (vi) Use of Calculator, Log Table, Slide Rule and Mobile is not allowed.
- (vii) The answer(s) of the questions must be marked by shading the circles against the question by dark pencil only. For example if only 'B' choice is correct then,

the correct method for filling the bubble is

A	B	C	D
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

the wrong method for filling the bubble are

- |     |                       |                                  |                       |                       |
|-----|-----------------------|----------------------------------|-----------------------|-----------------------|
| (a) | A                     | B                                | C                     | D                     |
|     | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| (b) | A                     | B                                | C                     | D                     |
|     | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| (c) | A                     | B                                | C                     | D                     |
|     | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> |

The answer of the questions in wrong or any other manner will be treated as wrong.

Name of the candidate

Regn. Number

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I have read all the instructions and shall abide by them.

I have verified all the information filled in by the candidate.

.....  
Signature of the Candidate

.....  
Signature of the invigilator

DO NOT BREAK THE SEAL WITHOUT BEING INSTRUCTED TO DO SO BY THE INVIGILATOR

# Physics

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## SECTION – I

### Straight Objective Type

This section contains 28 multiple choice questions. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

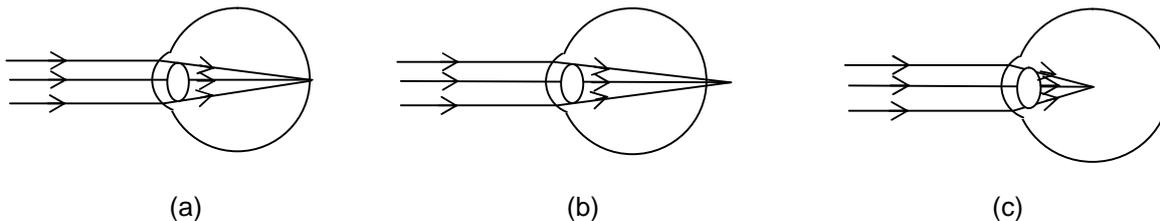
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- If the object is placed between the principal focus and the pole of the concave mirror, image is  
(A) real (B) inverted (C) diminished (D) virtual
- The focal length of a convex mirror,  $f = 12$  cm and the object is placed at a distance of 15 cm from the convex mirror. Find the position of the image.  
(A) 6.66 cm (B) 3.33 cm (C) 0.15 cm (D) 1.5 cm
- Which of the following statements is false regarding refractive index?  
(A) Refractive index is the measurer of the optical density of medium.  
(B) The more the refractive index of a material is, the more the light bends while travelling from a given medium to that medium.  
(C) The unit of refractive index is cm/s  
(D) None of the above
- $v_1$  and  $v_2$  are the velocities of light in the first medium and the second medium respectively.  $c$  is the velocity of light in air or vacuum, then  $n_{21}$  is equal to  
(A)  $\frac{v_1}{v_2}$  (B)  $\frac{v_2}{v_1}$  (C)  $\frac{c \times v_2}{v_1}$  (D)  $\frac{v_1}{c \times v_2}$
- Which of the following phenomena is not an effect of total internal reflection?  
(A) Formation of mirage  
(B) Sparking of diamond  
(C) Transportation of image through optical fibre  
(D) The part of a stick immersed in water appears bent.
- When the object is placed beyond  $2F_1$  of a convex lens the image is  
(A) formed between  $F_2$  and  $2F_2$ . (B) Virtual  
(C) Erect (D) Magnified
- A mirror is placed at the bottom of a container and then water is poured on it. A person is viewing his image formed by that mirror. Which of the following is the correct order of the phenomena involved in this process?  
(A) Reflection, Refraction, Refraction (B) Refraction, Refraction, Reflection  
(C) Reflection, Refraction, Reflection (D) Refraction, Reflection, Refraction
- If a real, inverted and highly magnified image is required to be formed at infinite distance by a convex lens, the object should be placed  
(A) at  $F_1$  (B) at  $2F_1$  (C) beyond  $2F_1$  (D) between  $F_1$  and  $2F_1$
- The star that is closest to the solar system is  
(A) Sirius (B) Alpha centauri (C) Orion (D) Pole star

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*Space for rough work*

10. Which of the following statement(s) is/are true regarding the pole star?  
 (A) Its position is fixed with respect to the earth  
 (B) Its position is aligned along the axis of rotation of the earth  
 (1) Only (A) (B) Only (B) (C) Both (A) and (B) (D) None of (A) and (B)
11. Which of the following planets move with a highest orbital speed around the sun?  
 (A) Earth (B) Venus (C) Mercury (D) Neptune
12. Which of the following planets rotate from east to west?  
 (A) Venus (B) Mars (C) Earth (D) Mercury
13. The reactions that take place continuously in the sun are \_\_\_\_\_  
 (A) Nuclear fission (B) Decomposition (C) Chemical (D) Nuclear fusion
14. Figure (a), (b) and (c) respectively, represent

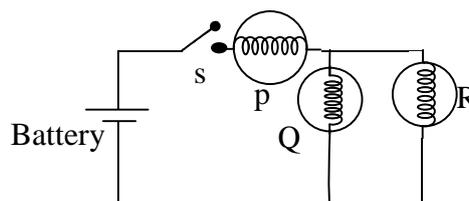


- (A) the normal eye, the hypermetropic eye and myopic eye  
 (B) the hypermetropic eye, the myopic eye and the normal eye  
 (C) the normal eye, the myopic eye and the hypermetropic eye  
 (D) the myopic eye, the normal eye and the hypermetropic eye
15. Two unequal resistances  $R_1$  and  $R_2$  are connected in series with a battery. Which of following quantity will be same through both resistors.  
 (A) Only current (B) Only voltage  
 (C) Both of current and voltage (D) None of current and voltage
16. A uniform wire of resistance  $50\Omega$  is cut in to 5 equal parts. These parts are connected in parallel. The equivalent resistance of the combination is  
 (A)  $2\Omega$  (B)  $10\Omega$   
 (C)  $250\Omega$  (D)  $100\Omega$
17. Speed of sound wave depends on the.  
 (A) Only on source (B) Only on Medium  
 (C) both of source and Medium (D) Non – source and medium
18. In a transverse wave a particle crosses its mean position of 20 times per second. If speed of wave is 200 m/s what is the wave length of wave.  
 (A) 10m (B) 20m  
 (C) 5m (D) 40m

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*Space for rough work*

19. A cylindrical wire of length  $l$  and radius  $r$  having resistance  $R$ . If wire stretched such that radius become  $\frac{r}{2}$ . What will be the resistance of new shape of wire.  
 (A)  $16R$  (B)  $8R$   
 (C)  $4R$  (D)  $\frac{R}{4}$
20. Speed of sound will be maximum in  
 (A) iron (B) wood  
 (C) water (D) air
21. Speed of sound wave of frequency  $200\text{Hz}$  in air is  $340\text{m/s}$ . The speed of sound wave of frequency  $400\text{Hz}$  in same air is  
 (A)  $340\text{ m/s}$  (B)  $680\text{ m/s}$   
 (C)  $170\text{ m/s}$  (D)  $3 \times 10^8\text{ m/s}$
22. Which form of energy is contained in wind energy  
 (A) Kinetic energy (B) Potential energy  
 (C) Electric energy (D) Thermal energy
23. Which of following is true for isotopes of specimen of  $U^{235}$  and  $U^{238}$   
 (A) Both contain same number of neutrons.  
 (B) Both contain same number of proton, electron and neutron.  
 (C) Both contain same number of proton and electron but different number of neutron.  
 (D)  $U^{238}$  contain less number of  $U^{235}$
24. Three identical bulbs are connected to a battery as shown in the adjoining figure. When the circuit is closed by means of the switch  $s$ ; it is found that  
 (A)  $R$  will be bright out  $Q$  and  $P$  dim  
 (B)  $P$ ,  $Q$  and  $R$  all will be equally bright  
 (C)  $Q$  and  $R$  immediately burn out  
 (D)  $P$  will be bright, but  $Q$  and  $R$  dim




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*Space for rough work*

25. A man stands in between two cliffs x and y, such that he is at distance of 66m from x. When he blows a whistle he hears first echo after 0.4 second and. The speed of sound is.  
(A) 330 m (B) 320 m  
(C) 340 m (D) 310 m
26. A glass rod is rubbed with a silk cloth. The glass rod acquires a charge of  $+19.2 \times 10^{-19}$  C. What will be the number of electron lost by rod.  
(A) 6 (B) 12  
(C) 24 (D) None of these
27. What is the amount of heat required to convert 500g of ice in to water without change of temperature? (Latent heat of ice =  $3.34 \times 10^5$  J/kg)  
(A)  $1.67 \times 10^5$  J (B)  $6.68 \times 10^5$  J  
(C)  $0.875 \times 10^5$  J (D) None of these
28. The weight of a person is 60kg. If the gets 1000 calories of heat through food and the efficiency of his body is 28% then up to how much height he can climb? ( $g = 10\text{m/s}^2$ )  
(A) 100cm (B) 196cm  
(C) 400cm (D) 1000cm

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**Space for rough work**

# CHEMISTRY

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## SECTION – II

### Straight Objective Type

This section contains 28 multiple choice questions. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

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29. CFC's are not being used in refrigerators because they-  
(A) Deplete ozone (B) Cause allergic reaction  
(C) Increase temperature (D) Both B & C
30. Which of the following is not a layer of atmosphere  
(A) Troposphere (B) Chromospheres (C) Stratosphere (D) Mesosphere
31. Suspended particulate matter in the air  
(A) Increases food intake (B) Decreases food intake  
(C) Censes liver sorosis (D) May cause difficulty in breathing
32. Coal is important solid fuel used in/ for-  
(A) Domestic purposes (B) Industries (C) Power stations (D) All of these above
33. Coal gas is used as  
(A) Industrial fuel (B) Domestic fuel (C) Illuminant (D) All the above
34. Refining of petroleum is done by  
(A) Destructive distillation (B) Distillation  
(C) Fractional distillation (D) Carbonization
35. Petroleum contains  
(A) Mixture of hydrocarbons (B) Trace amounts of sulphur  
(C) Trace amounts of oxygen and nitrogen (D) All the above
36. Which of the following is not obtained during fractional distillation of petroleum?  
(A) Diesel oil (B) Paraffin wax (C) Kerosene (D) Producer gas
37. Natural gas is used as  
(A) Domestic fuel (B) Automobile fuel  
(C) For the manufacture of carbon black (D) All the above
38. Incomplete combustion of methane forms  
(A) Carbon monoxide and water (B) Carbon monoxide and hydrogen  
(C) Carbon dioxide and water (D) Carbon dioxide and hydrogen
39. All hydrocarbons burn to produce  
(A)  $\text{CO}_3 + \text{O}_2$  (B)  $\text{CO}_2 + \text{H}_2\text{O} + \text{energy}$   
(C) It is a pungent smelling gas (D) It causes global warming
40. Which of the following allotropes of carbon adsorbs colour?  
(A) Wood charcoal (B) Bone charcoal (C) Coke (D) Coal

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*Space for rough work*

41. An example of non-combustible material is  
(A) Wood (B) Water (C) Paper (D) Cloth
42. An explosion is a combustion reaction that results in the  
(A) Production of heat (B) Production of light  
(C) Release of large volumes of gases (D) All the above
43. Which of the following is inexhaustible resource of energy?  
(A) Coal (B) Petroleum  
(C) Nuclear Power (D) Tidal power
44. The source of "BITUMEN" is  
(A) Coal (B) Petroleum  
(C) Producer gas (D) None
45. Which of the following fuel will cause knocking in engine?  
(A) CNG (B) LPG  
(C) Diesel (D) Petrol
46. Aviation turbine fuel (ATF) is  
(A) Fine grade petroleum by product.  
(B) A mixture of kerosene and gasoline.  
(C) A mixture of diesel and gasoline.  
(D) Liquefied Natural Gas
47. Transportation of petroleum by pipeline is difficult due to  
(A) It's high viscosity.  
(B) Tendency to catch fire easily.  
(C) Cracking of it due to difference in temperature.  
(D) All of these
48. Which of the following oxide can react both with acid and base?  
(A)  $\text{Al}_2\text{O}_3$  (B)  $\text{ZnO}$   
(C)  $\text{PbO}_2$  (D) All of these
49. When NaOH mixed with HCl it will react to form NaCl and  $\text{H}_2\text{O}$ . The reaction can be termed as  
(A) Acid base reaction  
(B) Neutralization reaction  
(C) Double displacement reaction  
(D) All of these
50. Which of the Following is not able to furnish  $\text{H}^+$  ion ?  
(A)  $\text{Na}_2\text{HPO}_3$  (B)  $\text{NaHCO}_3$   
(C)  $\text{Na}_2\text{HPO}_4$  (D)  $\text{NaHSO}_3$

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**Space for rough work**

51. Allotropes of carbon should not have  
(A) Similar chemical properties.  
(B) Different physical properties.  
(C) Similar chemical reactivity.  
(D) All of these.
52. Which of the following is not an example of crystalline allotrope of carbon?  
(A) Diamond (B) Graphite  
(C) Fullerene (D) Coal
53. The reaction given below is an example of  
 $(\text{NH}_4)_2\text{Cr}_2\text{O}_7 \xrightarrow{\Delta} \text{N}_2 + \text{Cr}_2\text{O}_3 + 4\text{H}_2\text{O}$   
(A) Redox reaction  
(B) Decomposition reaction  
(C) Endothermic reaction  
(D) All of these.
54. Which of the following metal will not produce hydrogen on reaction with HCl  
(A) Na (B) Ca  
(C) Cu (D) Zn
55. Tomatoes generally contains  
(A) Tartaric acid (B) Oxalic acid  
(C) Citric acid (D) Lactic acid
56. Basicity of an acid is defined as  
(A) No of  $\text{OH}^-$  replaceable (B) No of  $\text{H}^+$  replaceable  
(C) No of  $\text{H}_2\text{O}$  formed (D) None of these

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*Space for rough work*

# MATHEMATICS

## SECTION – III

### Straight Objective Type

This section contains 22 multiple choice questions. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

57. The mean proportion between 3 and 27 is  
(A) 9 (B) 18 (C) 12 (D) 21
58. If  $a : b = 5 : 7$ , then  $(3a + 5b) : (5a - 2b) =$   
(A) 40:7 (B) 50:11 (C) 35:9 (D) 17:5
59. In a map, 0.8 cm can represents 8.8 km. How much distance will be represented by 80.5 cm on the map?  
(A) 805 km (B) 885.5 km (C) 664 km (D) None of these
60. If  $2A = 3B = 5C$  then  $A : B : C =$   
(A) 2 : 3 : 5 (B) 6 : 10 : 15 (C) 15 : 10 : 6 (D) None of these
61. Polygons forming a polyhedron are called.  
(A) edges (B) faces (C) vertices (D) lines
62. Points of intersection of edges of a polyhedron are called  
(A) edges (B) faces (C) vertices (D) lines
63. In a prism, side faces are  
(A) square (B) rectangle (C) parallelogram (D) triangle
64. In a right prism, the angle between the lateral edge and its base is  
(A)  $30^\circ$  (B)  $60^\circ$  (C)  $90^\circ$  (D)  $0^\circ$
65. Which of the following is a polyhedron?  
(A) sphere (B) cylinder (C) cube (D) cone
66.  $f(x) = x^4 - 2x^3 + 3x^2 - ax + b$  leaves remainder 5 and 19 on division by  $(x-1)$  and  $(x+1)$  respectively. When  $f(x)$  is divided by  $(x-2)$ , the remainder is equal to  
(A) 8 (B) 10 (C) 12 (D) None of these
67.  $(x-k)$  is the HCF of  $x^2 + x - 12$  and  $2x^2 - kx - 9$  then the value of k is  
(A) 0 (B) -3 (C) 3 (D) can't determined
68. The value of the polynomial  $x^2 + 4\sqrt{2}x + 6$ , when  $x = \frac{1}{\sqrt{2}}$   
(A)  $\frac{21}{2}$  (B)  $\frac{10}{2}$  (C)  $\frac{11}{\sqrt{2}}$  (D)  $\frac{21}{2\sqrt{2}}$

*Space for rough work*

69. The remainder when  $x^{4a} + x^{2a}y^{2b} + y^{4b}$  is divided by  $x^{2a} + x^a y^b + y^{2b}$ , is equal to  
(A) 0 (B) 1 (C) -1 (D)  $y^b$
70. The value of  $(102)^3$  is equal to  
(A) 1061208 (B) 1081208 (C) 1041306 (D) 1061404
71. When  $kx^3 + 9x^2 + 4x - 8$  is divided by  $x + 3$  leaves the remainder -20, then value of k is  
(A) 2 (B) 3 (C) 4 (D) 5
72. The x-coordinates of a point is its distance from  
(A) x-axis (B) y-axis (C) origin (D) none of these
73. The y-coordinates of point is its distance from  
(A) x-axis (B) y-axis (C) origin (D) none of these
74. The coordinates of the origin are  
(A) (0, 0) (B) (0, 1) (C) (1,0) (D) (1,1)
75. The x – coordinate of every point on y-axis is  
(A) zero (B) one (C) two (D) none of these
76. The y-coordinate of every point on x-axis is  
(A) one (B) two (C) zero (D) none of these
77. The smallest number which can be written in the form of the sum of two positive cubes in two different ways is  
(A) 1729 (B) 9 (C) 1512 (D) 8
78. The formula relating the number of vertices, faces and edges of polyhedron is  
(A)  $V + F - E = 2$  (B)  $V + E - F = 2$  (C)  $E + F - V = 2$  (D)  $V + F - E + 2 = 0$

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**Space for rough work**

# JEE EXPERT

## Going - IX (SAT) ANSWERS

### PHYSICS

1.	D	2.	A	3.	C	4.	A
5.	D	6.	A	7.	D	8.	A
9.	B	10.	C	11.	C	12.	A
13.	D	14.	A	15.	A	16.	A
17.	B	18.	B	19.	A	20.	A
21.	A	22.	A	23.	C	24.	D
25.	A	26.	B	27.	A	28.	B

### CHEMISTRY

29.	A	30.	B	31.	D	32.	D
33.	D	34.	C	35.	D	36.	D
37.	D	38.	A	39.	B	40.	B
41.	B	42.	D	43.	C	44.	B
45.	C	46.	B	47.	D	48.	D
49.	D	50.	A	51.	C	52.	D
53.	B	54.	C	55.	B	56.	B

### MATHEMATICS

57.	A	58.	B	59.	B	60.	C
61.	B	62.	C	63.	C	64.	C
65.	C	66.	B	67.	C	68.	A
69.	A	70.	A	71.	B	72.	B
73.	A	74.	A	75.	A	76.	C
77.	A	78.	A				