WHIZ SEARCH (SAMPLE PAPER)

CLASS – 10th [ENGINEERING]

Important Instructions:

- This paper contains 45 questions among 4 Sections (Physics, Chemistry, Mathematics and Mental ability & Reasoning).

- All questions are compulsory.

- Sections (Physics, Chemistry and Mathematics) contains 10 questions each.

- Section (Mental ability & Reasoning) contains 15 questions only.

- Each question is allotted **4 marks for correct response**.

- **1 mark will be deducted** for marking incorrect or multiple responses.

- No deduction will be made from total marks for unattempted questions.

- For each question, there is **only 1 correct** response.

#SECTION# PHYSICS
#PART# SECTION (Maximum Marks: 40)

(1.) A current 10 A is flowing through the conductor AB. What will be the current induced in the circular wire of radius 1 m. See figure.
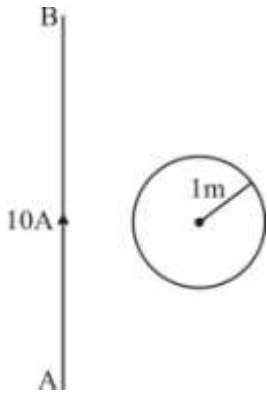
(a.) 0 A
(b.) 5 A
(c.) 10A
(d.) 20A

Ans: A
Exp:

(2.) The maximum focal length of the eye-lens of a person is greater than its distance from the retina. The eye is :
(a.) Always strained while looking at an object.
(b.) Strained for objects at large distances only.
(c.) Strained for objects at short distances only.
(d.) Unstrained for all distances.

Ans: D
Exp:

(3.) The refracting angle of a prism is A and refractive index of the material of prism is cot(A/2). The angle of minimum deviation is
(a.) $180° – 3A$
(b.) $180° + 2A$
(c.) $90° – A$
(d.) $180° – 2A$

Ans: D
Exp:

(4.) A particle's q/m value is given by s and it is moving with a speed v towards a wall at a distance d, in a direction which is perpendicular to the wall. What minimum magnitude of magnetic field should exist in this region so that the particle doesn't hit the wall?

(a.) $\dfrac{v}{sd}$

(b.) $\dfrac{2v}{sd}$

(c.) $\dfrac{v}{2sd}$

(d.) $\dfrac{v}{4sd}$

Ans: A
Exp:

(5.) A 100 W, 250 V bulb B_1, and two 60 W, 250 V bulbs B_2 and B_3, are connected to a 250 V source, as shown in the figure. Now W_1, W_2 and W_3 are the output power of the bulbs B_1, B_2 and B_3 respectively. Then :
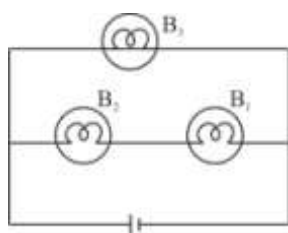
(a.) $W_1 > W_2 = W_3$
(b.) $W_1 > W_2 > W_3$
(c.) $W_1 < W_2 = W_3$
(d.) $W_1 < W_2 < W_3$

Ans: D
Exp:

(6.) The refractive index of a certain medium X is 1.6 and light travels in a medium Y. The velocity of light in Y is 'z' time in X. Calculate the refractive index of medium Y.
(a.) 1.6 z
(b.) z/1.6
(c.) 1.6/z
(d.) 1.6

Ans: C
Exp:

(7.) In the fission reaction $^{235}U + {}^{1}n_0 \rightarrow {}^{141}Ba + {}^{92}Kr +$ neutrons, the number of neutron produced is, (The atomic number of U, Ba and Kr are 92, 56 and 36 respectively).
(a.) 0
(b.) 1
(c.) 2
(d.) 3

Ans: D
Exp:

(8.) Choose the correct option for name of colour obtain from following colour equations.
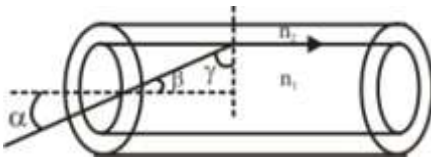(i) White – Blue = _____
(ii) White – Blue – Green = _____

(a.) Red, Yellow
(b.) Yellow, Red
(c.) Blue, Red
(d.) Blue, Yellow

Ans: B
Exp:

(9.) Value of β such that final refracted ray move parallel to n_1, n_2 interface
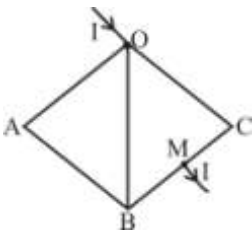(where $n_1 = 5/3$, $n_2 = 4/3$ & $\tan 53° = 4/3$).

(a.) 90°
(b.) 37°
(c.) 53°
(d.) 45°

Ans: B
Exp:

(10.) In figure $R_{OC} = R_{OA} = R_{AB} = R_{BC} = r$, and M is a mid point so $R_{CM} = R_{BM} = \dfrac{R_{BC}}{2} = \dfrac{r}{2}$, find net
resistance across O and M. (where OC, OA, OB, AB, BC and BM are resistances).

(a.) $\dfrac{3}{8}r$

(b.) $\dfrac{21}{26}r$

(c.) $\dfrac{3}{7}r$

(d.) $\frac{5}{7}r$

Ans: B
Exp:

#SECTION# CHEMISTRY
#PART# SECTION (Maximum Marks: 40)

(11.) In given compounds which one is most ionic compound?
(a.) NaCl
(b.) CsF
(c.) $MgCl_2$
(d.) LiBr

Ans: B
Exp:

(12.) pH of 0.00005 M H_2SO_4 solution is:
(a.) 4
(b.) 5
(c.) 6
(d.) 7

Ans: A
Exp:

(13.) $CH_3COOH + CH_3CH_2OH \xrightarrow{\text{dil} H_2SO_4} A$; A is :
(a.) Ethyl methanoate
(b.) Methyl ethanoate
(c.) Ethyl ethanoate
(d.) Methyl methanoate

Ans: C
Exp:

(14.) Nitric acid can't be used in place of sulphuric acid in labs for the preparation of hydrogen chloride as :
(a.) It is more volatile that hydrochloric acid
(b.) It is more volatile that sulphuric acid
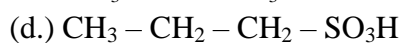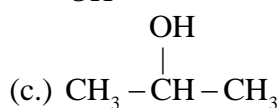(c.) It reacts with hydrochloric acid
(d.) It decomposes easily

Ans: D
Exp:
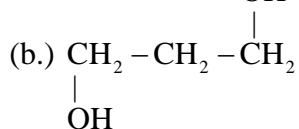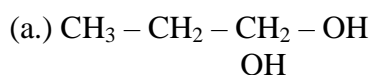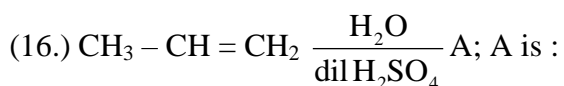
(15.) The IUPAC name of oxalic acid is :

(a.) Ethanoic acid
(b.) Ethanol
(c.) Ethanedioic acid
(d.) Ethanediol

Ans: C
Exp:

(16.) $CH_3 - CH = CH_2 \xrightarrow[\text{dil}\,H_2SO_4]{H_2O} A$; A is :

(a.) $CH_3 - CH_2 - CH_2 - OH$

(b.) $CH_2 - CH_2 - \overset{\overset{\displaystyle OH}{|}}{CH_2}$
       |
      OH

(c.) $CH_3 - \overset{\overset{\displaystyle OH}{|}}{CH} - CH_3$

(d.) $CH_3 - CH_2 - CH_2 - SO_3H$

Ans: C
Exp:

(17.) What is aqua regia?
(a.) 1 : 2 Mixture of Chromic acid and sulphuric acid
(b.) 1 : 3 Mixture of Conc. HCl and Conc. HNO_3
(c.) 1 : 1 Mixture of Conc. H_2SO_4 and Conc. HCl
(d.) 1 : 3 Mixture of Conc. HNO_3 and Conc. HCl

Ans: D
Exp:

(18.) From the list of elements given below which of the following option contains three metalloids?
(a.) Si, Ge, Zr, Te
(b.) Si, P, S, Cl
(c.) As, Bi, Br, Kr
(d.) Po, Co, Fe, Xe

Ans: A
Exp:

(19.) A student set-up an apparatus for finding the melting point of ice. When half the ice melted, the temperature shown by thermometer is :
(a.) more than 0°C
(b.) less than 0°C
(c.) zero degree Celsius
(d.) 100°C

Ans: C
Exp:

(20.) In Benzene number of covalent bonds present :
(a.) 18
(b.) 12
(c.) 6
(d.) 15

Ans: D
Exp:

#SECTION# MATHEMATICS
#PART# SECTION (Maximum Marks: 40)

(21.) If the LCM of the Polynomial $f(x) = (x + 1)^5 (x + 2)^a$ and $g(x) = (x + 1)^b (x + 2)^5$ is $(x + 1)^a$ $(x + 2)^b$ then find the minimum value of a + b.
(a.) 10
(b.) 14
(c.) 15
(d.) 5

Ans: A
Exp:

(22.) In a test of 50 questions, each correct answer fetches two marks and each wrong answer fetches – 1/2 marks. A candidate attempted all the questions and scored 40 marks. How many questions did he/she attempt correctly?
(a.) 24
(b.) 26
(c.) 22
(d.) 20

Ans: B
Exp:

(23.) If $y^2 + 6y - 3m = 0$ and $y^2 - 3y + m = 0$ have a common root then find the possible values of m.
(a.) $0, -\dfrac{27}{16}$
(b.) $0, -\dfrac{81}{16}$
(c.) $0, \dfrac{81}{16}$
(d.) $0, \dfrac{27}{16}$

Ans: D
Exp:

(24.) Find the sum of the series 1 + (1 + 2) + (1 + 2 + 3) + ----------- + (1 + 2 + 3 + -------- +20).
(a.) 1470
(b.) 1540
(c.) 1610
(d.) 1370

Ans: B
Exp:

(25.) Value of $\dfrac{\tan^3\theta-1}{\tan\theta-1}$ is
(a.) $\sec^2\theta + \tan\theta$
(b.) $\sec^2\theta - \tan\theta$
(c.) 0
(d.) $\tan\theta - \sec^2\theta$

Ans: A
Exp:

(26.) Value of $\sqrt{-4+\sqrt{8+16\cos ec^4\alpha+\sin^4\alpha}}$ is :
(a.) $\csc\alpha$ - $\sin\alpha$
(b.) $2\csc\alpha + \sin\alpha$
(c.) $2\csc\alpha$ - $\sin\alpha$
(d.) $\csc\alpha$ - $2\sin\alpha$

Ans: C
Exp:

(27.) From a point on the ground, the angle of elevation of an aeroplane flying at an altitude of 500 m changes from 45° to 30° in 5 seconds. Find the speed of aeroplane (in km/h).
(a.) $720(\sqrt{3}-1)$
 (b.) $720(\sqrt{3}+1)$
(c.) $360(\sqrt{3}-1)$
(d.) $360(\sqrt{3}+1)$

Ans: C
Exp:

(28.) Given f(x) is a cubic polynomial in x. If f(x) is divided by (x + 3), (x + 4), (x + 5) and (x + 6) then it leaves the remainder 0, 0, 4 and 6 respectively. Find the remainder when f(x) is divided by (x + 7).
(a.) 0
(b.) 1
(c.) 2
(d.) 3

Ans: A
Exp:

(29.) The arithmetic mean of the squares of first n natural numbers is :

(a.) $\dfrac{(n+1)\,(2n+1)}{6}$
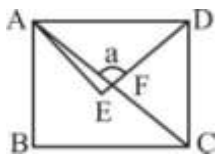
(b.) $\dfrac{2n+1}{6}$

(c.) $\dfrac{n^2-1}{6}$

(d.) $\dfrac{n(n+1)}{4}$

Ans: A
Exp:

(30.) In the following figure ABCD is a square and AED is an equilateral triangle. Find the value of a.

(a.) 30°
(b.) 45°
(c.) 60°
(d.) 75°

Ans: D
Exp:

#SECTION# MENTAL ABILITY & REASONING
#PART# SECTION 1 (Maximum Marks: 60)

(31.) If > denote +, < denotes −, + denotes ÷, ∧ denotes ×, − denotes =, x denotes > and = denotes <, choose the correct statement in the question given below.
(a.) $14 > 18 + 9 = 16 + 4 > 1$
(b.) $4 > 3 \,\wedge\, 8 < 1 - 6 + 2 > 24$
(c.) $3 < 6 \,\wedge\, 4 > 25 = 8 + 4 > 1$
(d.) $12 > 9 \wedge 3 < 6 \times 25 + 5 > 6$

Ans: B
Exp:

(32.) Study the following information to answer the given questions.
(i) Eight friends A, B, C, D, E, F, G and H are seated is a circle facing centre.

(ii) D is between B and G and F is between A and H.
(iii) E is second to the right of A.

Which of the following is A's position ?
(a.) left of F
(b.) Right of F
(c.) Between E and F
(d.) can't be determined

Ans: B
Exp:

(33.) Study the following information to answer the given questions.
(i) Eight friends A, B, C, D, E, F, G and H are seated is a circle facing centre.
(ii) D is between B and G and F is between A and H.
(iii) E is second to the right of A.

Which of the following is C's position ?
(a.) Between E and A
(b.) Between G and E
(c.) Second to the left of B
(d.) Can't be determined

Ans: A
Exp:

(34.) Pointing to a man in a photograph, Anita said "His brother's father is the only son of my grandfather" How is the Anita related to the man in the photograph ?
(a.) Mother
(b.) Aunt
(c.) Sister
(d.) Daughter

Ans: C
Exp:

(35.) From point P, Akshay starts walking towards East. After walking 30 metres, he turns to his right and walks 10 metres. He then turns to his right and walks for 30 metres. He again turns to his right and walks 30 metres. How far is he from Point P and in which direction ?
(a.) Point P itself
(b.) 10 metres North
(c.) 20 metres West
(d.) 20 metres North

Ans: D
Exp:

(36.) **Bank** is related to **Money** in the same way **Transport** is related to.
(a.) Goods
(b.) Road
(c.) Terrace
(d.) Floor

Ans: A
Exp:

(37.) In this given questions, three out of the four alternatives are same in a certain way and so form a group. Find the odd one that does not belong to the group.
(a.) Teeth
(b.) Tongue
(c.) Palate
(d.) Chin

Ans: D
Exp:

(38.) If the alphabets were written in the reverse order, which letter will be the fifth letter to the right of the fourteenth letter from the left.
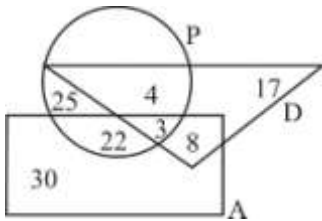(a.) R
(b.) I
(c.) S
(d.) H

Ans: A
Exp:

(39.) Study the following figure carefully and answer the questions:
The triangle represented doctors. The circle represents players and the rectangle represents artists.
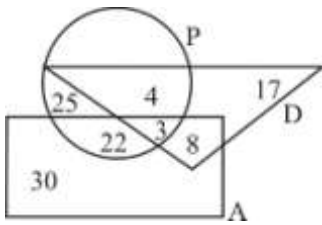

How many doctors are both players and artists?
(a.) 6
(b.) 8
(c.) 4
(d.) 3

Ans: D
Exp:

(40.) Study the following figure carefully and answer the questions:
The triangle represented doctors. The circle represents players and the rectangle represents artists.
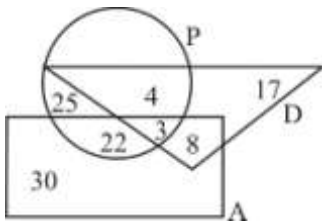
How many artists are players?
(a.) 30
(b.) 29
(c.) 25
(d.) 17

Ans: C
Exp:

(41.) Study the following figure carefully and answer the questions:
The triangle represented doctors. The circle represents players and the rectangle represents artists.

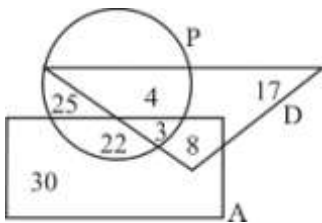How many artists are neither players nor doctors?
(a.) 29
(b.) 30
(c.) 22
(d.) 8

Ans: B
Exp:

(42.) Study the following figure carefully and answer the questions :
The triangle represented doctors. The circle represents players and the rectangle represents artists.

How many doctors are neither players nor artists?
(a.) 17
(b.) 30
(c.) 8
(d.) 19

Ans: A

Exp:

(43.) Karan was born on Saturday 22nd March 1982. On what day of the week was he 14 years 7 months and 8 days of age ?
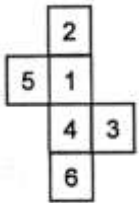(a.) Sunday
(b.) Tuesday
(c.) Wednesday
(d.) Monday

Ans: D
Exp:

(44.) How many times are the hands of a clock coincide in a day ?
(a.) 10
(b.) 11
(c.) 12
(d.) 22

Ans: D
Exp:

(45.) Which of the following dices is identical to the unfolded figure as shown here ?

(a.)

(b.)

(c.)

(d.)

Ans: A
Exp: