

# FIITJEE COMMON TEST

## PHYSICS, CHEMISTRY & MATHEMATICS

PH-II

CODE: 131708.1

SET - A

Time Allotted: 3 Hours

Maximum Marks: 294

- Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.
- You are not allowed to leave the Examination Hall before the end of the test.

### INSTRUCTIONS

**Caution: Question Paper CODE as given above MUST be correctly marked in the answer OMR sheet before attempting the paper. Wrong CODE or no CODE will give wrong results.**

#### A. General Instructions

1. Attempt ALL the questions. Answers have to be marked on the OMR sheets.
2. This question paper contains Three Parts.
3. **SECTION-I** is Physics, **SECTION -II** is Chemistry and **SECTION -III** is Mathematics.
4. Each part is further divided into three sections: **PART-A, PART-B & PART-C**
5. Rough spaces are provided for rough work inside the question paper. No additional sheets will be provided for rough work.
6. Blank Papers, clip boards, log tables, slide rule, calculator, cellular phones, pagers and electronic devices, in any form, are not allowed.

#### B. Filling of OMR Sheet

1. Ensure matching of OMR sheet with the Question paper before you start marking your answers on OMR sheet.
2. On the OMR sheet, darken the appropriate bubble with **Blue/Black Ball Point Pen** for each character of your Enrolment No. and write in ink your Name, Test Centre and other details at the designated places.
3. OMR sheet contains alphabets, numerals & special characters for marking answers.

#### C. Marking Scheme For All Three Parts.

- (i) **Part-A (01 – 08)** contains 8 multiple choice questions which have only one correct answer. Each question carries **+3 marks** for correct answer and **– 1 mark** for wrong answer.
- (ii) **(09 - 14) 2 comprehension (3 questions each with single option correct)** Each question carries **+3 marks** for correct answer and **– 1 mark** for wrong answer.
  - (i) **(15 – 18)** contains 4 multiple choice questions which have one or more than one correct answer. Each question carries **+4 marks** for correct answer. There is no negative marking.
  - (ii) **Part-B (01 – 02)** contains 2 Matrix Match Type questions containing statements given in 2 columns. Statements in the first column have to be matched with statements in the second column. Each question carries **+8 marks** for all correct answer. For each correct row **+2 marks** will be awarded. There may be one or more than one correct choice. No marks will be given for any wrong match in any question. There is no negative marking.
  - (iii) **Part-C (01 – 06)** contains 6 Numerical based questions with single digit integer as answer, ranging from 0 to 9 and each question carries **+4 marks** for correct answer. There is no negative marking

Name of the Candidate : \_\_\_\_\_

Batch : \_\_\_\_\_ Date of Examination : \_\_\_\_\_

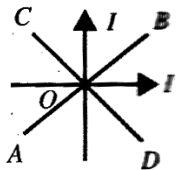
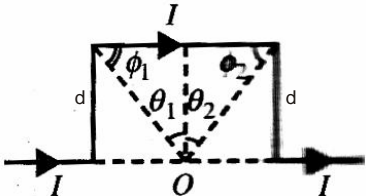
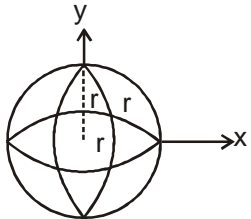
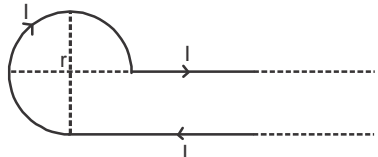
Enrolment Number : \_\_\_\_\_

BATCHES : NEFY822A01, W822A01-A03, NETHW922A01

## SECTION – I (PHYSICS)

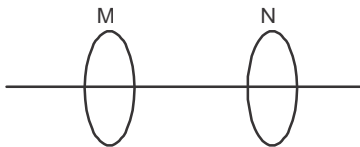
## PART – A

## Single Correct Choice Type

1. Two equal electric currents are flowing perpendicular to each others as shown in the figure. AB and CD are perpendicular to each other and symmetrically placed with respect to the currents. Where do we expect the resultant magnetic field to be zero?  
 (A) on AB (B) on CD  
 (C) on both AB and CD (D) on both OD and BO
- 
2. What is the magnetic field at O due to current in the infinite wire forming a loop as shown in the following figure?  
 (A)  $\frac{\mu_0 I}{4\pi d}(\sin \theta_1 + \sin \theta_2)$  (B)  $\frac{\mu_0 I}{4\pi} \times \frac{2I}{d}$   
 (C)  $\frac{\mu_0 I}{4\pi d}(\sin \phi_1 + \sin \phi_2)$  (D)  $\frac{\mu_0}{4\pi} \times \frac{I}{d}$
- 
3. An atom of mass number A and atomic number Z emits successively an  $\alpha$ -particles,  $\beta$ -particles and  $\gamma$ -rays. The mass number and atomic number of the end product are  
 (A) A, Z + 1 (B) A - 1, Z - 4 (C) A - 4, Z - 1 (D) A - 4, Z + 2
4. Three rings each having equal radius R, are placed mutually perpendicular to each other & each having its center at the origin of the coordinate system. If  $\vec{B}$  is the magnetic field produced by each ring, then the magnitude of the magnetic field at the common center is :  
 (A) 3B (B) Zero  
 (C)  $\sqrt{3}$  B (D)  $(\sqrt{3} - 1)B$
- 
5. Which of the following is not ultimately derived from sun's energy?  
 (A) Geothermal energy (B) Wind energy (C) Nuclear energy (D) Bio-mass
6. The function of coolant is to :  
 (A) Extract heat from the reactor (B) Slow down neutrons  
 (C) Control the reaction (D) Reflect the neutrons
7. Current I is flowing in conductor shaped as shown in the figure. The radius of the curve part is r and the length of straight portion is very large. The value of the magnetic field at the centre O will be :  
 (A)  $\frac{\mu_0 I}{4\pi r} \left( \frac{3\pi}{2} + 1 \right)$  (B)  $\frac{\mu_0 I}{4\pi r} \left( \frac{3\pi}{2} - 1 \right)$   
 (C)  $\frac{\mu_0 I}{4\pi r} \left( \frac{\pi}{2} + 1 \right)$  (D)  $\frac{\mu_0 I}{4\pi r} \left( \frac{\pi}{2} - 1 \right)$
- 

Space for Rough Work

8. Two identical circular coils M and N are arranged coaxially as shown in the figure. separation between the coils is large as compared to their radii. The arrangement is viewed from left along the common axis. The sign convention adopted is that currents are taken to be positive when they appear to flow in clockwise direction. Then which one is incorrect :



- (A) if M carries a constant positive current and is moved towards N, a positive current is induced in N  
 (B) if M carries a constant positive current and N is moved towards M, a negative current is induced in N.  
 (C) if a positive current in M is switched off, a positive current is momentarily induced in N  
 (D) if both coils carry positive currents, they will attract each other

### Comprehension Type

#### Paragraph (9-11)

Modern Trains are based on Maglev Technology in which trains are magnetically levitated, which runs its EDS Maglev System. These are coils on both sides of wheels. Due to motion of train current induces in the coil of track which levitate it. This is in accordance with Lenz's law. If trains lower down, then due to Lenz's law a repulsive force increases due to which train gets uplifted and if it goes much high then there is a net downward force due to gravity. The advance of Maglev train is that there is no friction between the trains and the track, thereby reducing power consumption and enabling the train to attain very high speeds. disadvantage of Maglev train is that as it slows down the electromagnetic force decreases and it becomes difficult to keep it levitated and as it moves forwards, according to Lenz's law there is an electromagnetic drop force.

9. What is the advantage of this system ?  
 (A) No friction, hence no power consumption (B) No electric power is used  
 (C) Gravitation force is zero (D) Electrostatic force draws the train
10. What is the advantage of this system ?  
 (A) Train experiences an upward force according to Lenz's law  
 (B) Friction force creates a drag on the train  
 (C) Retardation  
 (D) By Lenz's law, train experiences a drag
11. Which force causes the train to elevate up ?  
 (A) Electrostatic force (B) Induce electric field (C) Magnetic force (D) None of these

#### Paragraph (12-14)

A nucleus of mass  $M + \Delta m$  is at rest & decays into two daughter nuclei of equal mass  $\frac{M}{2}$  each. Speed of light is  $c$ .  
 Q value gives the energy emitted / gained during this transfer

12. The binding energy per nucleon for the parent nucleus is  $E_1$  and that for the daughter nuclei is  $E_2$ . Then  
 (A)  $E_2 = 2E_1$  (B)  $E_1 > E_2$  (C)  $E_2 > E_1$  (D)  $E_1 = 2E_2$
13. Speed of daughter nuclei is:  
 (A)  $c \frac{\Delta m}{M + \Delta m}$  (B)  $c \sqrt{\frac{2\Delta m}{M}}$  (C)  $c \sqrt{\frac{\Delta m}{M}}$  (D)  $c \sqrt{\frac{\Delta m}{M + \Delta m}}$
14. Q value for the reaction will be:  
 (A) Positive (B) Negative (C) Zero (D) Can not be determined

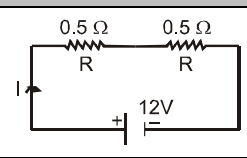
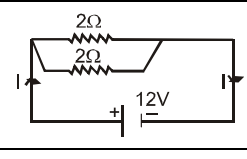
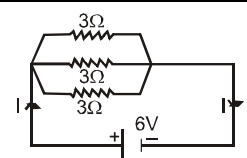
**Space for Rough Work**

**Multiple Correct Choice Type**

15. Two heater wires of equal length are first connected in series and then in parallel; the ratio of :  
 (A) Their resistances is 4 : 1 (B) Their resistances is 2 : 1  
 (C) The heats produced in them is 1 : 2 (D) The heats produced in them is 1 : 4
16. Choose the correct options?  
 (A) The source of unlimited energy in sun is nuclear fusion  
 (B) The source of unlimited energy in sun is nuclear fission  
 (C) In nuclear reactor beryllium is used in/as Moderator  
 (D) None of these
17. Which of the following fuel material did not occur naturally  
 (A)  $U^{235}$  (B)  $Pu^{241}$  (C)  $Pu^{239}$  (D)  $U^{233}$
18. In case of motion of a charged particle in a steady magnetic field :  
 (A) Speed remains constant (B) Momentum remains constant  
 (C) Kinetic energy remains constant (D) Work done is always Zero

**PART – B  
 MATRIX MATCH TYPE**

1. Match the column :

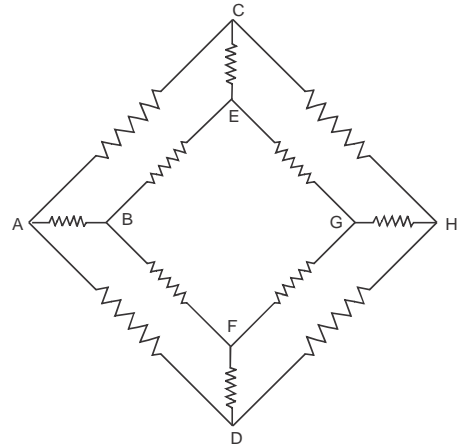
Column – A		Column - B	
(A)		(P)	$R_{eq} = 1\Omega, I = 12A$
(B)		(Q)	$\propto \text{Length}$
(C)	Resistance	(R)	$R_{eq} = 1\Omega, I = 6A$
(D)		(S)	$\propto \frac{1}{\text{Area}}$

2. Match the column

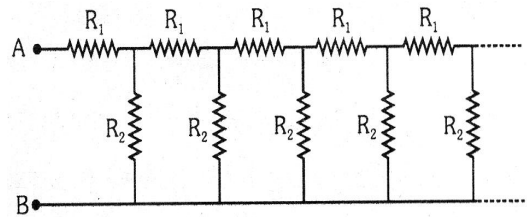
Column – I		Column - II	
(A)	Renewable source of energy	(P)	Chain reaction
(B)	Nuclear energy	(Q)	Afforestation
(C)	Absorption of harmful gases	(R)	Wind
(D)	Nuclear fission	(S)	Nuclear reaction
		(T)	Uranium

**PART – C**  
**Integer Type**

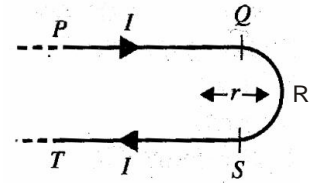
1. Twelve resistors each of resistance  $1\Omega$  are connected in the circuit shown in the adjoining figure. Net resistance between points A and H is  $\frac{K}{8}$ . Find the value of K.



2. An infinite sequence of resistance is shown in the figure. The resultant resistance between A and B will be when  $R_1 = 1\Omega$  and  $R_2 = 2\Omega$ .

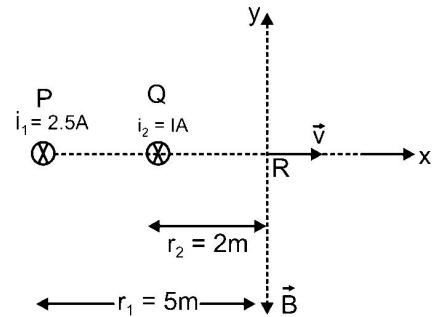


3. A long wire is bent into the shape PQRST as shown in the following figure with QRS being a semicircle with center O radius  $r$  metre. A current of  $I$  ampere flows through it in the direction it in the direction  $P \rightarrow Q \rightarrow R \rightarrow S \rightarrow T$ . Then the magnetic induction at the point O of the figure in vacuum is  $\frac{\mu_0(2 + \pi)}{K\pi r}$  then find K ?



4. A straight PQ of a circuit lies along the x-axis from  $x = -(a/2)$  to  $x = +(a/2)$  and carries a steady current  $I$ . The magnetic field due to the section PQ at a point  $x = +a$  is  $K \frac{\mu_0 I}{4\pi d}$  then find K ?

5. Two long parallel wires carrying currents  $2.5\text{ A}$  and  $I\text{ A}$  in the same direction (directed into plane of the paper) are held at P and Q respectively such that they are perpendicular to the plane of paper. The points P and Q are located at a distance of  $5$  meters and  $2$  meters respectively from a collinear point R. An electron moving with a velocity of  $4 \times 10^5\text{ m/s}$  along the positive x-direction experiences a force of magnitude  $3.2 \times 10^{-20}\text{ N}$  at the point R. Find the value of  $I$  in amperes.



6. A horizontal overhead power line carries a current of  $100\text{ A}$  in east-west direction what is the magnitude of the magnetic field due to this current  $4\text{ m}$  below the line (in  $\mu\text{ T}$ ) ?

**Space for Rough Work**

## SECTION – II (CHEMISTRY)

## PART – A

## Single Correct Choice Type

- Cryolite and Fluorspar are added to Alumina during electrolytic reduction to :  
(A) Reduce the melting point of alumina  
(B) Increase the electrical conductivity of molten alumina  
(C) Both (A) and (B)  
(D) None of these
- The most common ore of iron is :  
(A) Bauxite (B) Galena (C) Cryolite (D) Haematite
- Beakers A, B and C contain zinc sulphate, silver nitrate and iron (II) sulphate solutions respectively. Copper pieces are added to each beaker. Blue colour will appear in case of :  
(A) Beaker A (B) Beaker B (C) Beaker C (D) All the beakers
- The oxide of non metal which is neutral is :  
(A)  $\text{SO}_2$  (B)  $\text{NO}_2$  (C)  $\text{P}_2\text{O}_5$  (D) CO
- The pH of a 0.002 M acetic acid solution. It is 2.3% ionized at a given dilution, is  
[ $\log 4.6=0.6627$ ]  
(A) 4.3372 (B) 2.337 (C) 1.43372 (D) 5.227
- pH of a solution is 5. If it is changed to pH = 2 by adding acid.  $[\text{H}^+]$  will increase  
(A) 1000 times (B) 2.5 times (C) 100 times (D) 5 times
- In the extraction of Iron from Haematite, limestone is added to act as :  
(A) Flux (B) Slag (C) Reducing agent (D) Oxidising agent
- Auto reduction process is used in the extraction of :  
(A) Cu and Hg (B) Zn and Hg (C) Cu and Al (D) Fe and Pb

## Comprehension Type

## Paragraph (9-11)

In the combined state the metals are found in the crust of the earth as oxides, carbonates, sulphides, silicates, phosphates, etc. Various compounds of the metals which are found in earth's crust are known as minerals. Minerals extracted from the crust of the earth are not associated with large number of earthy, rocky and silicious impurities. Known as gangue or matrix. The mineral from which the metal can be economically and conveniently extracted is called Ore.

- The impurities associated with the ore after mining are collectively called :  
(A) flux (B) slag (C) minerals (D) gangue
- Alkali metals do not exist in free state in nature because these are :  
(A) very reactive (B) very volatile  
(C) metallic in nature (D) highly electronegative elements
- The formula of carnallite is :  
(A)  $\text{LiAl}(\text{Si}_2\text{O}_5)_2$  (B)  $\text{KCl} \cdot \text{MgCl}_2 \cdot 6\text{H}_2\text{O}$  (C)  $\text{K}_2\text{OAl}_2\text{O}_3 \cdot 6\text{SiO}_2$  (D)  $\text{KCl} \cdot \text{MgCl}_2 \cdot 2\text{H}_2\text{O}$ .

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**Space for Rough Work**

## Paragraph (12-14)

Sulphur and rest of the elements of group 16 are less electronegative than oxygen. They can acquire eight electrons by sharing two electrons with the atoms of other elements and thus can exhibit +2 oxidation state in their compounds. Their atoms have vacant d-orbitals in their valence shell to which electrons can be promoted from p and s-orbitals of the same shell

12. The nature of the compounds of sulphur having +4 oxidation state is :  
 (A) act as oxidising agents (B) act as reducing agents  
 (C) act as oxidising as well as reducing agents (D) can not be predicted
13. Oxygen exhibits +2 oxidation state in  
 (A)  $H_2O$  (B)  $OF_2$  (C)  $Cl_2O$  (D)  $H_2O_2$
14. Like sulphur, oxygen does not show +4 and +6 oxidation states, the reason is  
 (A)  $O_2$  is gas while sulphur is solid  
 (B) Oxygen has high ionisation energy in comparison to sulphur  
 (C) Oxygen has high electron affinity in comparison to sulphur  
 (D) Oxygen has no d-orbitals in its valence shell

## Multiple Correct Choice Type

15. For the following redox reaction, which of the following statement is incorrect?  
 $ClO_3^- \longrightarrow Cl^- + ClO_4^-$   
 (A)  $ClO_3^-$  is gaining 5 electrons per ion  
 (B)  $ClO_3^-$  is losing 2 electrons per ion  
 (C)  $ClO_3^-$  is losing as well as gaining 2 electrons per ion  
 (D)  $ClO_3^-$  is losing as well as gaining 5 electrons per ion
16. Vapour phase refining is used for the purification of  
 (A) Ti (B) Ni (C) Hg (D) Zn
17. Which of the following can not undergo a chemical reaction  
 (A)  $MgSO_4 + Zn$  (B)  $ZnSO_4 + Fe$  (C)  $CaSO_4 + Pb$  (D)  $CuSO_4 + Al$
18. Which of the following alloys contain zinc.  
 (A) Brass (B) German Silver (C) Bronze (D) Bell metal

PART – B  
MATRIX MATCH TYPE

1. Match the following

List-I		List-II	
(A)	MgO	(P)	Acidic Flux
(B)	$CaSiO_3$	(Q)	Basic Flux
(C)	$Ca_3(PO_4)_2$	(R)	Thomas Slag
(D)	$SiO_2$	(S)	Used in cement industry
		(T)	Used as a fertilizer

Space for Rough Work

2. Match column I with column II and select the correct option

Column – I		Column - II	
(A)	Copper glance	(P)	Sulphate ore
(B)	Calamine	(Q)	Halide ore
(C)	Rock salt	(R)	Sulphide ore
(D)	Epsom slat	(S)	Carbonate ore

**PART – C**  
**Integer Type**

- Total number of metals given below which can replace  $Mg^{2+}$  ion from aq. solution of  $MgCl_2$ .  
Na, Au, Cu, Al, Ag, Zn, Fe
- What is the number of unpaired electrons in the valence shell of the member of oxygen family.
- Among the following the number of elements showing only one non zero oxidation state is :  
O, Cl, F, N, P, Sn, TI, Na, Ti
- Number of moles of electrons needed to convert one mole  $NO_3^-$  ion to  $N_2H_4$  are \_\_\_\_\_.
- In  $N_2$  molecule, there are \_\_\_\_\_ covalent bond.
- Alkali earth metal possess \_\_\_\_\_  $e^-$  in their valency shell.

**Space for Rough Work**

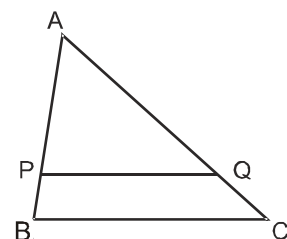
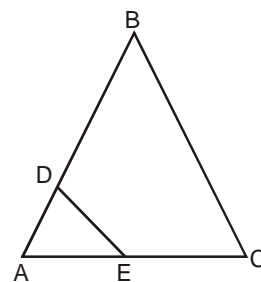


## SECTION – III (MATHEMATICS)

## PART – A

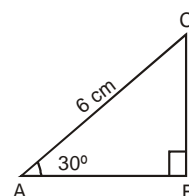
## Single Correct Choice Type

1. If  $b \tan \theta = a$ , the value of  $\frac{a \sin \theta - b \cos \theta}{a \sin \theta + b \cos \theta}$
- (A)  $\frac{a-b}{a^2+b^2}$       (B)  $\frac{a+b}{a^2+b^2}$       (C)  $\frac{a^2+b^2}{a^2-b^2}$       (D)  $\frac{a^2-b^2}{a^2+b^2}$
2. If  $\sin \theta = \frac{24}{25}$  and  $\theta$  lies in the second quadrant, then  $\sec \theta + \tan \theta =$
- (A)  $-7$       (B)  $6$       (C)  $4$       (D)  $-5$
3.  $\cot x - \tan x =$
- (A)  $\cot 2x$       (B)  $2 \cot^2 x$       (C)  $2 \cot 2x$       (D)  $\cot^2 2x$
4. In a triangle  $\triangle ABC$ , points P, Q and R are the mid-points of the sides AB, BC and CA respectively. If the area of the triangle ABC is 20 sq. units, then area of the triangle PQR equal to
- (A) 10 sq. units      (B)  $5\sqrt{3}$  sq. units      (C) 5 sq. units      (D) 5.5 sq. units
5. If each side of triangle ABC is of length 4 and if AD is 1 cm and  $ED \perp AB$ . What is area of region BCED—
- (A)  $8\sqrt{3}$  cm<sup>2</sup>      (B)  $4\sqrt{3}$  cm<sup>2</sup>  
 (C)  $4.5\sqrt{3}$  cm<sup>2</sup>      (D)  $3.5\sqrt{3}$  cm<sup>2</sup>
6. In the adjacent figure, P and Q are points on the sides AB and AC respectively of a triangle ABC. PQ is parallel to BC and divides the triangle ABC into 2 parts, equal in area. The ratio of PA : AB =
- (A) 1 : 1      (B)  $(\sqrt{2}-1) : \sqrt{2}$   
 (C)  $1 : \sqrt{2}$       (D)  $(\sqrt{2}-1) : 1$



**Space for Rough Work**

7. In the adjoining figure, the length of BC is  
 (A)  $2\sqrt{3}$  cm (B)  $3\sqrt{3}$  cm  
 (C)  $4\sqrt{3}$  cm (D) 3 cm



8. If the angle of depression of an object from a 75 m high tower is  $30^\circ$ , then the distance of the object from the tower is  
 (A)  $25\sqrt{3}$  m (B)  $50\sqrt{3}$  m (C)  $75\sqrt{3}$  m (D) 150 m

**Comprehension Type**  
**Paragraph for Question 9 to 11**

If  $\sin C + \sin D = 2\sin \frac{C+D}{2} \cos \frac{C-D}{2}$  then answer the following questions

9. What is the value of  $\cos 68^\circ + \cos 72^\circ$   
 (A)  $2\sin 20^\circ \cos 2^\circ$  (B)  $2\cos 20^\circ \sin 2^\circ$  (C)  $\sin 70^\circ$  (D) None of these
10. What is the value of  $\sin 12^\circ + \sin 102^\circ$   
 (A) 1 (B) 0 (C) -1 (D) None of these
11. If  $\sin C + \sin D = 0$  then what may be the value of  $C + D$  in radian  
 (A)  $2\pi$  (B)  $\pi/2$  (C)  $\pi/4$  (D) can't say

**Paragraph for Question 12 to 14**

The angle of elevation of top of a tower from a point A on the ground is  $30^\circ$ . On moving a distance of 20 meters towards the foot of the tower to a point B, the angle of elevation increases to  $60^\circ$ . Answer the following questions.

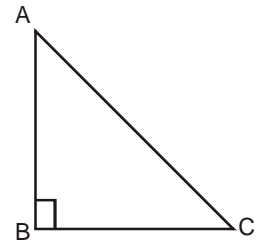
12. What is the height of the tower  
 (A) 15 m (B)  $\frac{10}{\sqrt{3}}$  m (C) 16.82 m (D)  $10\sqrt{3}$  m
13. Distance of the tower from point A  
 (A) 10 m (B) 30 m (C) 20 m (D)  $10\sqrt{3}$  m
14. What is angle of depression of point B from top of the tower  
 (A)  $30^\circ$  (B)  $60^\circ$  (C)  $45^\circ$  (D) None of these

**Multiple Correct Choice Type**

15. Which among the following is/are not correct?  
 (A) The ratio of the areas of two similar triangles is equal to the ratio of their corresponding sides.  
 (B) The areas of two similar triangles are in the ratio of the corresponding altitudes.  
 (C) The ratio of area of two similar triangles are in the ratio of the corresponding medians.  
 (D) If the areas of two similar triangles are equal, then the triangles are congruent.

**Space for Rough Work**

16. In a right angled triangle  $\triangle ABC$ , length of two smaller sides are 8cm and 6cm, then which among the given statements is/ are correct ?  
 (A) Length of greatest side is 10cm  
 (B)  $\angle ACB > 90^\circ$   
 (C)  $\angle BAC > 90^\circ$   
 (D) Pythagoras theorem is not applicable here.



17.  $\cos 1^\circ \cdot \cos 2^\circ \cdot \cos 3^\circ \dots \cos 179^\circ$  is equal to—  
 (A)  $-1$  (B)  $0$  (C)  $1$  (D)  $1/\sqrt{2}$
18.  $\sin^2 \theta + \operatorname{cosec}^2 \theta$  is always —  
 (A) equal to 1 (B) less than 1  
 (C) greater than or equal to 2 (D) can be equal to 2

**PART - B**  
**MATRIX TYPE**

1. If  $\cos \theta - \sin \theta = 1/5$ , where  $0 < \theta < 90^\circ$ .

Column - I		Column - II	
(A)	$\frac{(\cos \theta + \sin \theta)}{2}$	(P)	$\frac{4}{5}$
(B)	$\sin 2\theta$	(Q)	$\frac{7}{10}$
(C)	$\cos 2\theta$	(R)	$\frac{24}{25}$
(D)	$\cos \theta$	(S)	$\frac{7}{25}$

2. If  $\cos \theta + \cos \beta = \frac{1}{2}$  and  $\sin \theta + \sin \beta = \frac{1}{3}$

Column - I		Column - II	
(A)	$\cos\left(\frac{\alpha + \beta}{2}\right)$	(P)	$\pm \frac{\sqrt{13}}{12}$
(B)	$\cos\left(\frac{\alpha - \beta}{2}\right)$	(Q)	$\frac{2}{3}$
(C)	$\tan\left(\frac{\alpha + \beta}{2}\right)$	(R)	$\pm \frac{3}{\sqrt{13}}$
(D)	$\tan\left(\frac{\alpha - \beta}{2}\right)$	(S)	$\pm \sqrt{\frac{131}{13}}$

**Space for Rough Work**

**PART – C**  
**Numerical Based**

1. Maximum value of  $\sin \theta + \cos \theta$  is  $\sqrt{k}$  then the value of K is \_\_\_\_\_.
  2. Lowest value of  $x^2 + 4x + 2$  is y, find  $y + 2$  ?
  3. A quadratic polynomial when divided by  $x + 2$  leaves a remainder of 1 and when divided by  $x - 1$ , leaves a remainder of 4. The remainder if it is divided by  $(x + 2)(x - 1)$  is  $x + k$ , find value of k.
  4. The value of  $\sin^2 A + \cos^2 A + 3$  is :
  5. In a right angle triangle smaller side is 6 and largest side is 10 find the third side.
  6. In a  $\triangle ABC$ , D and E are points on the sides AB and AC respectively such then  $DE \parallel BC$ . If  $AD = 4x - 3$ ,  $AE = 8x - 7$ ,  $BD = 3x - 1$  and  $CE = 5x - 3$ . Then find the value of x.
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***Space for Rough Work***