CHAPTER # 4
SOLVED (MCQS)
TURNING EFFECT & FORCES

Q. 1 Tick the correct answer. Also, fill up the Bubble Sheet.

1) The number of vectors that can be added by head to tail rule is:

A) 2	**B)** 3
C) Any number ☑	**D)** 4

2) The number of perpendicular component of a vector is:

A) 1	**B)** 2 ☑
C) 3	**D)** 4

3) In right angle triangle, length of base is 4cm and hypotenuse is 5cm then length of perpendicular is:

A) 1 cm	**B)** 3 cm ☑
A) 20 cm	**B)** 9 cm

4) A force of 10N is making an angle of 30° with the x-axis. Then value of horizontal component is:

A) 4 N	**B)** 5 N
C) 7 N	**D)** 8.7 N ☑

5) Formula for the direction of resultant force with the help of rectangular components is:

A) $\theta = \tan^{-1}\frac{F_x}{F_y}$	**B)** $\theta = \tan^{-1}\frac{F_y}{F_x}$ ☑
C) $\theta = \sin^{-1}\frac{F_y}{F_x}$	**D)** $\theta = \cos^{-1}\frac{F_y}{F_x}$

6) A force of 10 N makes an angle of 90° with $x - axis$. Its horizontal component will be:

A) 10 N	**B)** 5 N
C) Zero ☑	**D)** Maximum

7) $sin\theta$ is equal to:

A) $\frac{Base}{Hypothenuse}$	**B)** $\frac{Perpendicular}{Base}$
C) $\frac{Perpendicular}{Hypothenuse}$ ☑	**D)** $\frac{Hypothenuse}{Perpendicular}$

8) If 10 Newton force is making an angle 30° with $x - axis$, then value of vertical component is:

A) 56.6 N	**B)** 5 N ☑
C) 8.55 N	**D)** 0.5 N

9) Complete the equation θ =----------$\frac{F_y}{F_x}$

A) $\sin^{-1}$	**B)** Cos^{-1}
C) $\tan^{-1}$ ☑	**D)** tan

10) The value of tan 45° is:

A) 0.5	**B)** 1.732
C) 0.577	**D)** 1 ☑

11) $cos\theta$ is equal to:

A) $\frac{Base}{Hypothenuse}$ ☑	**B)** $\frac{Perpendicular}{Base}$
C) $\frac{Perpendicular}{Hypothenuse}$	**D)** $\frac{Base}{Perpendicular}$

12) If $F_y = 4N$ and $F_x = 3N$. What will the magnitude:

A) 7 N	**B)** 5 N ☑
C) 12 N	**D)** 10 N

13) Complete the equation: $\frac{F_y}{F_x}$ =----------

A) $sin\theta$	**B)** $cos\theta$
C) $tan\theta$ ☑	**D)** $cosec\theta$

14) Sin 45° is equal to:

A) 0	**B)** 0.5
C) 0.707 ☑	**D)** 1

15) The turning effect of a force is called:

A) Momentum	**B)** Torque ☑
C) Pressure	**D)** Work

16) In SI unit of torque is:

A) Nm ☑	**B)** Nm^{-1}
C) Nm^{-2}	**D)** ms^{-1}

17) The perpendicular distance between the axis of rotation and the line of action of force is called:

A) Torque	**B)** Moment Arm
C) Momentum	**D)** Work

18) Centre of gravity of sphere is at:

A) Centre of sphere ☑	**B)** Outside of sphere
C) Radius of sphere	**D)** None of these

19) The center of gravity of irregular shaped body can be found with the help of:

A) Wedge	**B)** Meter rod
C) Plum line ☑	**D)** Screw gauge

20) Point of intersection of medians is the center gravity of uniform:

A) Rod	**B)** Circular ring
C) Solid cylinder	**D)** Triangular sheet ☑

21) The centre of gravity of a uniform solid cylinder is at:

A) Middle point of intersection ☑	**B)** Centre of cylinder
C) The point of intersection of diagonals	**D)** Centre of plate

22) Racing cars are made stable by:

A) Increasing their speed	**B)** Decreasing their mass
C) Lowering their centre of gravity ☑	**D)** Decreasing their width

23) An example of equilibrium is:

A) Football ☑	**B)** Block
C) Pencil at its tip	**D)** Book on the table

24) A body is in equilibrium when its:

A) Acceleration is zero ☑	**B)** Speed is uniform
C) Both "A" & "B"	**D)** None of these

25) A pair of like parallel forces is:

A) 	**B)** 
C) 	**D)** Both "A" & "C" ☑

26) First condition of equilibrium is:

A) Σr	**B)** $\Sigma F = 0$ ☑
C) $\Sigma \frac{F_x}{F_y} = 0$	**D)** $\Sigma \frac{F_y}{F_x} = 0$

27) The single force that has the same effect as the combined effect of all the forces to:

A) Opposite force	**B)** Single force
C) Resultant force ☑	**D)** Resultant vector

28) The forces of 2 N and 4 N are acting in opposite directions. Their resultant force will be:

A) 2 N ☑	**B)** 4 N
C) 6 N	**D)** 8 N

29) In a right angled triangle, $cos\theta$ =?

A) $\frac{Perpendicular}{Hypotenuse}$	**B)** $\frac{Base}{Hypotenuse}$ ☑
C) $\frac{Perpendicular}{Base}$	**D)** $\frac{Base}{Perpendicular}$

30) $cos\theta$ =?

A) 0.577	**B)** 1.0 ☑
C) 0.866	**D)** 0.707

31) If base of a right angled, triangle is 4cm and its perpendicular is 3cm. Then, its hypotenuse will be:

A) 2 cm	**B)** 4 cm
C) 6 cm	**D)** 5 cm ☑

32) The angle between rectangular components of vector is:

A) 0°	**B)** 90° ☑
C) 180°	**D)** 270°

33) If F_x and F_y are rectangular components of a vector F, then the magnitude of vector F is:

A) $F = \sqrt{F_x^2 + F_y^2}$ ☑	**B)** $F = \sqrt{F_x^2 - F_y^2}$
C) $F = \sqrt{F_x^2 F_y^2}$	**D)** $F = F_x^2 + F_y^2$

34) If F_x and F_y are rectangular components of a vector F, then its direction is determined by the relation:

A) $\theta = \sin^{-1}\frac{F_y}{F_x}$	**B)** $\theta = tan^{-1}\frac{F_y}{F_x}$ ☑
C) $\theta = \tan^{-1}\frac{F_x}{F_y}$	**D)** $\theta = tan\frac{F_x}{F_y}$

35) If the applied force is "F" and its moment arm is "r", then torque can be define as:

A) $\pi = rF$ ☑	**B)** $\pi = r + F$
C) $\pi = r^2F$	**D)** $\pi = 2rF$

36) The force with which Earth attracts the object towards its center is known as:

A) Force	**B)** Weight
C) Mass	**D)** Gravity ☑

37) Two equal but unlike parallel forces having different line of action produce:

A) A torque	**B)** A couple ☑
C) equilibrium	**D)** Neutral equilibrium

38) The number of forces that can be added by head to tail rule:

A) 2	**B)** 3
C) 4	**D)** Any number ☑

39) The number of perpendicular components of a force are:

A) 1	**B)** 2 ☑
C) 3	**D)** 4

40) A force of 10 N is making an angle of 30° with the horizontal. Its horizontal component will be:

A) 4 N	**B)** 5 N
C) 7 N	**D)** 8.7 N ☑

41) A couple is formed by:

A) Two forces perpendicular to each other	**B)** Two like parallel forces
C) Two equal and opposite force in the same line ☑	**D)** Two equal and opposite force but not in the same line

42) A body is in equilibrium when its:

A) Acceleration is uniform	**B)** Speed is uniform
C) Acceleration is zero ☑	**D)** Speed and acceleration are uniform

43) A body is in neutral equilibrium when its center of gravity:

A) is at its highest position	**B)** is at the lowest position
C) keeps its height if displacement ☑	**D)** is situated at its bottom

44) The single force that has the same effect as the combined effect of all the forces to be added is called:

A) Parallel force	**B)** Net force
C) Resultant force ☑	**D)** Combined force

45) Weight and tension in a string are:

A) Perpendicular forces	**B)** Like parallel forces
C) Unlike parallel forces ☑	**D)** Inclined forces

46) If base of a right angled, triangle is 3 cm and its perpendicular is 4 cm. Then, its hypotenuse will be:

A) 2 cm	**B)** 4 cm
C) 5 cm ☑	**D)** 6 cm

47) If the applied force "F" and its moment are is "L", then torque is defined as:

A) $\pi = FL$ ☑	**B)** $\pi = FL_2$
C) $\pi = F + L$	**D)** $\pi 2FL$

48) Torque is a:

A) Base quantity	**B)** Vector quantity ☑
C) Scalar quantity	**D)** Both 'A' & 'B'

49) If the rotation is produced in anti-clock wise direction then the torque is taken as:

A) positive	**B)** negative ☑
C) zero	**D)** neutral

50) Center of gravity depends upon:

A) Mass of body	**B)** Weight of body ☑
C) Both 'A' & 'B'	**D)** Shape of body

51) There are ---------- states of equilibrium:

A) 1	**B)** 2 ☑
C) 3	**D)** Many

52) If on disturbing a body slightly, there is no change in the height of its centre of gravity, the body is in state of:

A) Stable equilibrium	**B)** Natural equilibrium ☑
C) Unstable equilibrium	**D)** Complete equilibrium