|  |  |
| --- | --- |
| PHYSICS | *Question Paper Type:* **L** |

1. Which Question Paper Type of Physics is given

to you?

1. Type F
2. Type E
3. Type L
4. Type S

2. What is the least possible error encountered when

taking measurement with a meter rule?

1. 02 mm
2. 0.1mm
3. 1.0 mm
4. 0.5mm

3. A quantity which requires magnitude and

direction to be specified is

1. mass
2. temperature
3. distance
4. displacement.

4. L Electrical potential

IL Torque

III. Kinetic energy
  
IV Momentum

Which of the quantities listed above are vectors?

1. II and III
2. II and IV
3. I and II
4. I and III

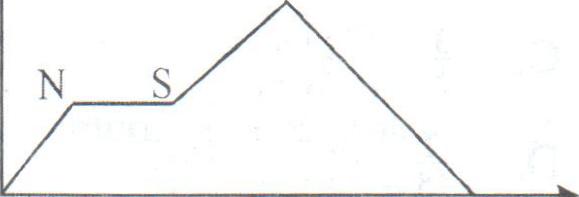
5. Which type of motion do the wheels of a moving

car undergo?

1. Translational and rotational motion.
2. Vibratory and translational motion.
3. Random and translational motion.
4. Rotational and oscillatory motion.

6.

V(111 )



M Q Timets)

From the diagram above, the region of zero acceleration is

1. SP
2. PQ
3. MN
4. NS

7. A car accelerates uniformly from rest at 3ms-2, its

velocity after travelling a distance of 24 m is

20

1. 36 ms-'
2. 12 ms-'
3. 144 ms-1
4. 72 ms--1

8. Calculate the escape velocity of a satellite

launched from the earth's surface if the radius of the earth is 6.4 x 106m.

1. 11.3 kms-'
2. 25.3 kms'
3. 4.2 lcms-'
4. 4.0 lcms-'

[g = 10 ms-2]

9. An object of weight 80 kg on earth is taken to a

planet where the acceleration due to gravity is one-third of its value on earth. The weight of the object on the planet is

1. 36N
2. 48N
3. 12N
4. 27N

[g = 10 ms-2]

10. One of the conditions necessary for an object to be in equilibrium when acted upon by a number of parallel forces is that the vector sum of the forces is

1. positive
2. average
3. zero
4. negative.

11. What happens when three coplanar non-parallel forces are in equilibrium?

1. Their lines of action meet at a point.
2. Their lines of action are parallel.
3. They are represented in magnitude only.
4. They are represented in direction only.

12. An object of mass 20 kg is released from a height of 10 m above the ground level. The kinetic energy

of the object just before it hits the ground is

|  |  |  |
| --- | --- | --- |
|  |  | 500 J |
|  |  | 200 J |
|  | 4 | 000 J |
|  | 2 | 000 J |

[g = 10 ms-2]

*Physics*

13. The energy in the nucleus of atoms produce heat which can be used to generate

1. potential energy
2. kinetic energy
3. mechanical energy
4. electrical energy.

14. A machine whose efficiency is 75% is used to lift a load of 1000N. Calculate the effort put in to the machine if it has a velocity ratio of 4.

1. 334.33 N
2. 343.32N
3. 233.33 N
4. 333.33 N

15. A wheel and axle is used to raise a load whose weight is 800N when an effort of 250N is applied. If the radii of the wheel and axle are 800 mm and 200 mm respectively, the efficiency ofthe machine is

1. 87%
2. 90%
3. 80%
4. 85%

16. A force of 500N is applied to a steel wire of cross-sectional area 0.2m2, the tensile stress is

1. 2.5 x 103Nm2
2. 2.5 x 104Nm2
3. 1.0 x 102Nm-2
4. 1.0 x 103Nm2

17.

A

Load N

T

0 Extension

From the diagram above, the point that represents the elastic limit is

1. S
2. T
3. Q
4. R

18. The small droplets of water that form on the grass in the early hours of the morning is

1. dew

21

*[Please turn over*

1. fog
2. haul
3. mist.

19. What is the equivalent of 20K in celsius scale?

1. 36 °C
2. 20 °C
3. 293 °C
4. 68 °C

20. A glass bottle of initial volume 2 x 10' cm' is heated from 20 °C to 50 °C. If the linear expansivity of glass is 9 x 10-6K--', the volume of the bottle at 50 °C is

|  |  |  |
| --- | --- | --- |
|  | 20 | 013.5 cm" |
|  | 20 | 016.2 cm' |
|  | 20 | 005.4 cm' |
|  | 20 | 008.1 cm' |

21. The equation P = constant reduces to

Charles law if

1. a=0, b=1 and c= —1
2. a=1, b=1 and c=0
3. a=1, b=0 and c=-1
4. a=0, b=1 and c=1

22. The quantity of heat needed to raise the temperature of a body by 1K is the body's

1. latent heat of fusion
2. heat capacity
3. internal energy
4. specific heat capacity.

23. The melting point of a substance is equivalent to its

1. solidification pressures
2. vapour pressure
3. solidification temperature
4. liquidification temperature.

24. The temperature at which the water vapour present in the air is just sufficient to saturate the air is

1. dew point
2. boiling point
3. ice point
4. saturation point.

*Physics*

25. Heat transfer by convection in a liquid is due to the

22

1. expansion of the liquid as it is heated
2. latent heat of vaporization of the liquid.
3. increased vibration of the molecules of the liquid about their mean position
4. variation of density of the liquid.

26. The distance between two successive crests of a wave is 15 cm and the velocity 300 ms-'. Calculate the frequency.

1. 4.5 x 102 Hz
2. 2.0 x 1021-1z
3. 4.5 x 103Hz
4. 2.0x 103Hz

27. A boy receives the echo of his clap reflected by a nearby hill 0.8s later. How far is he from the hill?

1. 264m
2. 528 m
3. 66 m
4. 136m

speed of sound in air = 340 ms-1]

|  |  |
| --- | --- |
| 28. |  |

The diagram above shows a stationary wave of wavelength 40 cm in a closed tube. The length L of the resonating air column is

1. 30 cm
2. 40 cm
3. 10 cm
4. 20 cm

29. An object is placed 10 m from a pinhole camera of length 25 cm. Calculate the linear magnification.

|  |  |  |
| --- | --- | --- |
|  | 2.5x | 10' |
|  | 2.5x | 102 |
|  | 2.5 x | 10-2 |
|  | 2.5 x | 10— |

30. The focal length of a concave mirror is 2.0 cm. If an object is placed 8.0 cm from it, the image is at

|  |  |
| --- | --- |
|  | 2.5 m |
|  | 2.7m |
|  | 2.0m |
|  | 2.3m |

31. In a compound microscope, the objective and the eye piece focal lengths are

1. the same
2. at infinity
3. long
4. short.

32. When a telescope is in normal use, the final image is at

1. the near point
2. infinity
3. the focus
4. the radius of curvature.

33. When a negatively-charged rod is brought near the cap of a charged gold leaf electroscope which has positive charges, the leaf

1. diverges
2. remains the same
3. collapses
4. collapses and diverges again.

34. What charge is stored in a 0.1F capacitor when a 10V supply is connected across it?

1. 2C
2. I C
3. 5C
4. 4C

|  |  |
| --- | --- |
| 35. |  |

31-Lf

Calculate the effective capacitance of the circuit above.

1. 31.if
2. Elpf
3. luf
4. 21.if

*Physics*

36. The maximum power transfer occurs in a cell when the external resistance is

23 *[Please turn over*

1. less than the internal resistance of the cell
2. twice the internal resistance of the cell
3. the same as the internal resistance of the
     
   cell
4. greater than the internal resistance of the
     
   cell.

37. If a metal wire 4 m long and cross-sectional area 0.8 mm2 has a resistance of 652, find the resistivity of the wire.

|  |  |  |
| --- | --- | --- |
|  | 3.2x | 10-60m |
|  | 5.3 x | 10-20m |
|  | 3.0 x | 10-50m |
|  | 1.2x 10-6Qm | |

38. A circuit has a resistance of 2000. The resistance of the circuit can be reduced to 1200 when

1. a 2400 resistor is connected to it in series
2. a 3000 resistor is connected to it in parallel
3. an 800 resistor is connected to it in series
4. a 1500 resistor is connected to it in parallel.

39. PHCN measures its electrical energy in

1. J
2. W
3. kWh
4. Wh

40. What is the best method of demagnetizing a steel bar magnet?

1. Solenoid method
2. Hammering
3. Heating it
4. Rough handling it.

41. The magnitude of the angle of dip.\* the equator is

1. 180°
2. 360°
3. 0°
4. 90°

*Use the diagram below to answer questions 42 and 43.*

Input lL Output

42. The diagram above is that of

1. an auto transformer
2. an oil transformer
3. a step-up transformer
4. a step-down transformer.

43. The electromotive force in the secondary winding is

1. stabilizing
2. varying
3. increasing
4. reducing.

44. What type of reaction is represented by the

equation 2 2 3 1

1 X+ 1 X—>2Y+on + energy Chain.

Ionization.

Fusion.

Fission.

45. When an atom undergoes a beta decay, the atomic number of the nucleus

1. becomes zero
2. remains unchanged
3. decreases by one
4. increases by one.

46. Calculate the mass of the copper deposited during electrolysis when a current of 4A passes through a copper salt for 2 hours.

1. 2.9 x 10° kg
2. 2.9x 105 kg
3. 9.5 x 10-7kg
4. 9.5 x 10-3 kg

[ece of copper z=3.3 x 10-7kgC-1

MATHEMATICS *Question Paper Type:* E

1. Which Question Paper "type of Mathematics is given to you?

1. Type F
2. Type E
3. Type 1.
4. Type S

|  |  |
| --- | --- |
| 2. Find the value of 110111, - 10100, | |
|  | 100101, |
|  | 1001011, |
|  | 1001111, |
|  | 11010112 |

3. A woman bought a grinder for N 60 000. She sold it at a loss of 15%. How much did she sell it?

|  |  |
| --- | --- |
| A. | N 52 000 |
| B. | N 51 000 |
| C. | N 50 000 |
| D. | N 53 000 |

4. Express the product of 0.00043 and 2000 in standard form.

|  |  |  |
| --- | --- | --- |
|  | 8.3 x 10' | |
|  | 8.6x | 10' |
|  | 8.6 x | 10 |
|  | 8.6 x | 10' |

5. A man donates 10% of his monthly net earnings to his church. If it amounts to

N4 500. what is his net monthly income?

|  |  |
| --- | --- |
|  | N 45 000 |
|  | N 52 500 |
|  | N 62 500 |
|  | N 40 500 |

6. If log 7.5 = 0.8751, evaluate

2 log 75 + log 750

14

1. 6.6253
2. 66.252
3. 66.253
4. 6.6252

7. Solve for x in

8x

1. 6
2. 8
3. 10
4. 4

8. Simplify ,F2

1. 3-16 + 7
2. 3-A -1
3. 3-16 +1
4. 3 - 7

9. Evaluate loo, 8 lou, 16- log, 4

1. 4
2. 5
3. 6 1-). 3

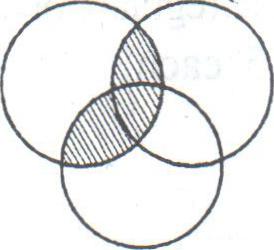
10. If P- {1, 2.3, 4. 5} and

P U Q {1. 2. 3. 4. 5. 6. 7}, list the elements in Q.

1. {7}
2. {6. 7}
3. {5, 7}
4. {6}

*Mathematics*

11.



R

From the venn diagram above, the shaded parts represent

1. *(PUQ)U(PUR)*
2. (PUQ)U(PUR)
3. *(PnOn(pnR)*
4. *(PUQ)U(PUR)*

12. If *mgt 2 — k — w =0,* make g the subject of the formula.

*k±w* t

A.

*k-w*

*12*

*k7w k±w*

t2

13. Factorise 2y2-15xy+18x2

`; — ■ ?

1. (2y-3.4y-6x)
2. (2y +3x)(y— 6x)
3. (3y +2x)(y —6x)
4. (2y —34(y+6x)

14. Find the value of *k* if y 1 is a factor of *v3 +4y2 +ky* — 6

|  |  |
| --- | --- |
|  | — 4 |
|  | 1 |
|  | 0 |
|  | — 6 |

15. y varies directly as w2. When y= 8, w =- find y when w =3

1. 12

15 *[Please turn over*

1. 9
2. 6
3. 18

16. *P* varies directly as *Q* and inversely as *R.* When *Q* =36 and *R* =16, *P* =27. Find the relation between *P, Q* and *R.*

1. *P =* 12Q
2. *P =12OR*
3. *p* 12 *OR*
4. *P=*

*12R*

17. What is the solution of < —19

•

1. x < —3 or 3 >1
2. —3 < x < 5
3. x < —3 or x > 5
4. —3 < x <1

18. Evaluate the inequality 2+ —175

1. x<\_3
2. —3
3. x < —4
4. x > 4

19. The 4th term of an A.P. is 13 while the 10th term is 31. Find the 24th term.

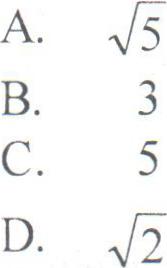
1. 75
2. 73
3. 69
4. 89

*Mathematics*

1. What is the common ratio of the G.P.

16

*vi0±j§)±(10±21)+...?*



1. A binary operation \* is defined by

x\*y = xY . If x\*2 =12— *x ,* find the possible values of x.

|  |  |  |
| --- | --- | --- |
|  | 3, | — 4 |
|  | —3, | 4 |
|  | —3, | — 4 |
|  | 3, | 4 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 22. | Find y if | | /5  2 | —6\rx\  -7,Y) |  |  | 7  —11, |  |
|  |  | 5 | |  | | | | |
|  |  | 3 | |  | | | | |
|  |  | 2 | |  | | | | |
|  |  | 8 | |  | | | | |
|  |  | — r, 12 |  |  | | | | |
| 23. | If | —1 4 | = | —12 find x. | | | | |
|  |  | —2 | |  | | | | |
|  |  | 3 | |  | | | | |
|  |  | 6 | |  | | | | |
|  |  | —6 | |  | | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| 24. | 0  Find the value of 1  0 | 3  7  5 | 2  8  4 |

1. 10
2. —1
3. —2
4. 12

25. How many sides has a regular polygon whose interior angle is 135' each?

|  |  |
| --- | --- |
|  | 10 |
|  | 9 |
|  | 8 |
|  | 12 |

In the figure above, KLIINM, LN bisects

L KNM. If angle KLN is 54° and angle MKN is 35', calculate the size of angle KMN.

|  |  |
| --- | --- |
|  | 89° |
|  | 37° |
|  | 19° |
|  | 91° |

0

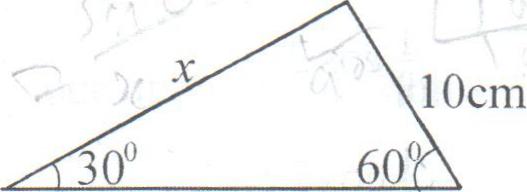
(p+-01)1'

From the figure above, what is the value of p?

|  |  |
| --- | --- |
|  | 90° |
|  | 60° |
|  | 45° |
|  | 135° |

*Mathematics*

28.



Find the value of x in the figure above.

1. 101;cm
2. 5,/j- cm
3. 4V3 cm

D. 2013- cm

29. If the angle of a sector of a circle with radius 10.5 cm is 120°, find the perimeter of the sector.

32. Find the mid point of S(-5, 4) and T(-3, —2)

|  |  |  |
| --- | --- | --- |
| A. | 4, | —2 |
| B. | — 4, | 1 |
| C. | 4, | —1 |
| D. | — 4, | 2 |

33. The gradient of the line joining (x, 4) and

|  |  |
| --- | --- |
| (1, 2) is . Find the value of x. | |
| A. | 3 |
|  | —3 |
|  | —5 |
|  | 5 |

34.

4

1. 43 cm
2. 45 cm
3. 48 cm
4. 40 cm

r=2]

30. A cylindrical tank has a capacity of 6160m3. What is the depth of the tank if the radius of its base is 28m?

1. 7.5 m
2. 5.0 m
3. 2.5 m
4. 8:0.m

[7r 22

7

31. The locus of a dog tethered to a pole with a rope of 4 m is a

1. circle with radius 4 m
2. semi-circle with diameter 4 m
3. semi-circle with radius 4 m
4. circle with diameter 4 m.

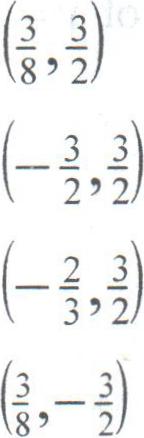
6 5 4 3 2 1 1 2 3 4 5

In the figure above, what is the equation of the line that passes the y-axis at (0, 5) and passes the x-axis at (5, 0)?

17 *[Please turn over*

1. *y = —x+5*
2. *y = x-5*
3. *y=—x-5*
4. *y = x +5*

35. Calculate the mid point of the line segment y — 4x + 3 = 0 which lies between the x-axis and y-axis.



*Mathematics*

**36.** Find the equation of the straight line

through (— 2, 3) and perpendicular to 4x + 3y —5 = 0

1. 3x+2y-18=0
2. 4x+5y+3=0
3. 5x-2y-11 = 0
4. 3x-4y+18=0

**37.** If sin *19 =* find the value of 1 + cos B .

18

13

8

13

5

13

25

13

**38. If** y = 4x3 — 2x2 + x, find -cd1-3,1 .

A. 8x2 — 4x +1

12x2., — 2x +1 12x' —4x+1

**D.** 8x2 — 2x +1

**39.** If y = cos 3x , find .

1. — I sin 3x

3

1. 3 sin 3x
2. —3 sin 3x
3. I sin 3x

3

**40.** Find the minimum value of y = x2 — 2x — 3

1. 1
2. —1
3. —4
4. 4

**41.** Evaluate ism 2x *cbc*

1. **1** cos 2x + k

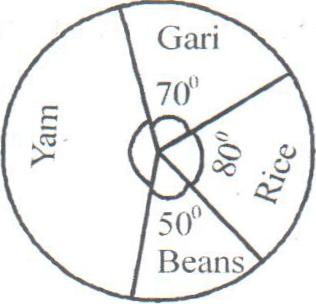
18

1. —I-cos2x+k 2
2. —cos 2x + k
3. cos 2x + k

**42.** Evaluate 1(2x + 3)1 *dx*

1. -} (2x + 3)2 + *k*
2. 4(2x +3)2 *+k*
3. -?f (2X + 3)4a +*k*
4. **(2x+ 3)6 *+k***

43.



The pie chart above shows the monthly distribution of a man's salary on food items. If he spent N 8 000 on rice, how much did he spend on yam?

1. l 18 000
2. N 16 000
3. N 12 000
4. N 24 000

44. The mean of 2—t, 4+t, 3-2t, 2-Ft and t-1 is

1. *—t*
2. 2
3. —2
4. *t*

*Mathematics*

45.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Values | 0 | 1 | 2 | 3 I 4 |
| Frequency | 1 | 2 | 2 | 1 9 |

Find the mode of the distribution above.

1. 2
2. 3
3. 4
4. 1

46. Find the median of 5, 9, 1, 10, 3, 8, 9, 2, 4, 5, 5, 5, 7, 3 and 6

1. 5
2. 4
3. 3
4. 6

48. In how many ways can a team of 3 girls be selected from 7 girls?

7!

4!

7!

3!4!

7!

2!5!

7!

3!

49.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Numbers | 1 | 2 | 3 | 4 | 5 | 6 |
| Frequency | 18 | 22 | 20 | 16 | 10 | 14 |

The table above represents the outcome of throwing a die 100 times. What is the 'probability of obtaining at least a 4?

|  |  |
| --- | --- |
| A. | 2 |

47. Calculate the standard deviation of 5, 4, 3, 2 and 1

|  |  |
| --- | --- |
|  | 2  5  3  4  5 |

50. A number is chosen at random from 10 to 30 both inclusive, what is the probability that the number is divisible by 3?

|  |  |
| --- | --- |
|  | 10  3  3  5  2  15 |

1. o

19 *[Please turn over*