BSF RO
Official Paper

Previous Year Paper

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Que. 1 If the radius of the earth decreases by 1% and its mass remains same, then the acceleration due to gravity.

1. increase by 1%
2. decrease by 1%
3. increase by 2%
4. decrease by 2%

Que. 2 A beam of monochromatic light is passing from one medium into another. Which one of the following quantities does not change?

1. Wavelength
2. Frequency
3. Velocity
4. Amplitude

Que. 3 Lambert's law is related to

1. reflection
2. illumination
3. interference
4. refraction

Que. 4 When light travels from one medium to another, total internal reflection does not occur in which of the following cases.

1. from glass to water.
2. from glass to air.
3. from water to air
4. from water to glass

Que. 5 A person standing before a furnace receives most of the heat by

1. Convection
2. Conduction
3. Radiation
4. Conduction and convection

Que. 6 The resistance of a certain length of wire having a diameter of 6 mm is 5 ohm. The wire is drawn such that diameter becomes 3 mm. The new resistance will be

1. 30 ohms
2. 5 ohms
3. 60 ohms

4. 80 ohms

Que. 7 Which one of the following pairs is **not** Correctly matched?

1. Capacitances - Coloumb/volt
2. Electric potential - Volt
3. Coulomb force - Coulomb × voltmeter
4. Electric field - Volt/meter

Que. 8 What is the device that steps up or steps down the voltage?

1. Dynamo
2. Conductor
3. Inductor
4. Transformer

Que. 9 An equilateral triangle has been constructed with a uniform wire whose resistance per unit length is 4Ω cm^{-1}. If the length of each side of the triangle is 10 cm, the resistance across any side will be

1. 80/3Ω
2. 80/Ω
3. 40/Ω
4. 40/3Ω

Que. 10 When all the molecules in a magnet arrange themselves in the direction of the magnetic field, the condition is called

1. Permeability
2. Saturation
3. Retentivity
4. Reluctance

Que. 11 At the center of a bar, magnetism is

1. maximum
2. minimum
3. zero
4. unknown

Que. 12 The largest voltage one can safely apply across a 50 ohm 0.5 W resistor is:

1. 5 V
2. 25 V
3. 100 V
4. 0.01 V

Que. 13 Time taken by a 100 watt bulb to consume 5000 J of energy is

1. 100 s
2. 500 s
3. 40 s
4. 50 s

Que. 14 The direction of electric current is always opposite to

1. direction of conventional current in metallic conductors
2. one ohm
3. the electric work done
4. None of these

Que. 15 The space between the walls of a thermous flask is a vaccum in order to avoid heat exchange due to

1. radiation
2. convection
3. conduction
4. conduction and convention

Que. 16 Number of electric lines of force passing through unit area is called

1. electric flux
2. density
3. electric field
4. None of these

Que. 17 To increase the range of an ammeter we need to connect a suitable

1. low resistance in parallel
2. low resistance in series
3. high resistance in parallel
4. high resistance in series

Que. 18 A tuning fork vibrates with 2 vibrations in 0.4 seconds. Its frequency is

1. 5
2. 6
3. 8
4. 2.5

Que. 19 A particle is undergoing simple harmonic motion with a period of 2 seconds and amplitude of 2 meters. Its maximum speed in ms^{-1} is

1. 4π
2. 2π

3. π/2
4. π

Que. 20 An object executes simple harmonic motion with amplitude A. Its acceleration will be maximum when the displacement is

1. A/4
2. 0
3. A/2
4. A

Que. 21 Which among the following is a form of Energy

1. Light
2. Pressure
3. Momentum
4. Power

Que. 22 One fermi meter is equal to

1. 10^{-15} m
2. 10^{15} m
3. 10^{-12} m
4. 10^{12} m

Que. 23 Two masses of 1 kg and 4 kg have same Kinetic energy. What is the ratio of their momenta

1. $\frac{1}{2}$
2. $\frac{1}{4}$
3. 2
4. 4

Que. 24 If two forces of 5N each are acting along X and Y-axis then the magnitude and direction of resultant is

1. $5\sqrt{2}, \pi/3$
2. $5\sqrt{2}, \pi/4$
3. $-5\sqrt{2}, \pi/3$
4. $-5\sqrt{2}, \pi/4$

Que. 25 The vector product of force (F) and distance (r) from the centre of action represents:

1. Kinetic Energy
2. Work
3. Potential energy

4. Torque

Que. 26 A body executing uniform circular motion has at any instant its velocity vector and acceleration vector

1. along the same direction
2. opposite direction
3. normal to each other
4. not related to each other

Que. 27 The flying of bird is a consequence of Newton's

1. First law
2. Second law
3. Third law of motion
4. Both (B) and (C)

Que. 28 A pendulum clock be taken from the earth to a revolving artificial satellite, it will:

1. run slow
2. run fast
3. given the same time
4. stop altogether

Que. 29 A solid iron ball is heated. which one of the following will have minimum percentage increase

1. radius
2. surface area
3. volume
4. density

Que. 30 An unpolarised beam is incident at an angle 60° an a glass surface and after reflection it is linearly polarised. The approximate refractive index of the glass is:

1. 1.4
2. 1.5
3. 1.7
4. 1.6

Que. 31 Just before striking the ground, a 0.5 kg body had a kinetic energy of 980 J. if friction is ignored, from what height it was dropped.

1. 980 m
2. 5.0 m
3. 200 m
4. 24.5 m

Que. 32 Decibel is

1. a musical instrument
2. The wavelength of noise
3. A measure of sound level
4. A musical note

Que. 33 Red colour appears during sunrise and sunset because of

1. Refraction
2. Dispersion
3. Scattering
4. Reflection

Que. 34 The scale of temperature in which the temperature is only positive is:

1. Farenheit
2. Celcius
3. Kelvin
4. Reaumur

Que. 35 A big drop of water is broken into smaller drops, the surface energy:

1. increases
2. decreases
3. remain same
4. can increase as well as decrease

Que. 36 In absence of the earth's atmosphere, the sky will appear

1. black
2. red
3. green
4. blue

Que. 37 The production of band spectra is caused by:

1. Atomic Nuclei
2. Hot metals
3. Molecules
4. Electrons

Que. 38 In order to rectify an alternating current one uses a:

1. Thermocouple
2. Diode
3. Triode

4. Transister

Que. 39 Sound waves are not transmitted to long distance because

1. They are absorbed by atmosphere
2. They have constant frequency
3. The height of antenna required should be very high
4. Velocity of sound waves is very less

Que. 40 Sparkling of diamond is due to:

1. Reflection
2. Dispersion
3. Total Internal Reflection
4. High refractive index

Que. 41 The number of possible outcomes, when a coin is tossed 6 times, is

1. 36
2. 64
3. 12
4. None of these

Que. 42 In a ΔABC, if $\frac{\tan A - \tan B}{\tan A + \tan B} = \frac{c-b}{c}$, then A is equal to

1. 30°
2. 45°
3. 60°
4. 90°

Que. 43 The principal value of $\sin^{-1}(-\sqrt{3}/2)$ is

1. -2π/3
2. -π/3
3. 4π/3
4. 5π/3

Que. 44 $\cot\left[\tan^{-1}\frac{1}{2} + \tan^{-1}\frac{1}{8}\right] = ?$

1. 3/2
2. -1
3. $\sqrt{2}$
4. $-\sqrt{2}$

Que. 45 The mean of 18 observation is -7 and if each observation is increased by 3, the mean of the new set is

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

Que. 46 The arithmetic mean of 9 observations is 100 and that of 6 is 80, the combined mean of all the 15 observations will be

1. 100
2. 80
3. 90
4. 92

Que. 47 The Minimum value of P = 6x + 16y subject to constraints $x \leq 40$, $y \geq 20$ and $x, y \geq 0$ is

1. 240
2. 320
3. 0
4. None of these

Que. 48 If $A = \begin{bmatrix} 1 & -5 & 7 \\ 0 & 7 & 9 \\ 11 & 8 & 9 \end{bmatrix}$, then trace of matrix A is

1. 17
2. 25
3. 3
4. 12

Que. 49 If $f(x) = \log_{x^2} x$, then f'(x) at x = e, is

1. 0
2. 1
3. 1/e
4. 1/(2e)

Que. 50 The normal to a given curve is parallel to x-axis if

1. $\frac{dy}{dx} = 0$
2. $\frac{dy}{dx} = 1$
3. $\frac{dx}{dy} = 0$

4. $\frac{dx}{dy} = 1$

Que. 51 The value of cosec (-750°) is

1. -2
2. 2
3. -3
4. None of these

Que. 52 sin (π/10) sin (13π/10) = ?

1. $\frac{1}{2}$
2. $-\frac{1}{2}$
3. $-\frac{1}{4}$
4. 1

Que. 53 If n is a +ve integer 4^n - 3n - 1 is divisible by

1. 3
2. 9
3. 8
4. 27

Que. 54 The distance of the point (x, y) from y-axis is

1. x
2. y
3. |x|
4. |y|

Que. 55 The lines x cos α + y sin α = p_1 and x cos β + y sin β = p_2 will be perpendicular if

1. α = β
2. $|\alpha - \beta| = \frac{\pi}{2}$
3. $\alpha = \frac{\pi}{2}$
4. $\alpha \pm \beta = \frac{\pi}{2}$

Que. 56 The circle $x^2 + y^2 + 4x - 7y + 12 = 0$ cuts an intercept on y-axis of length

1. 3
2. 4

3. 7
4. 1

Que. 57 The length of the chord cut off by $y = 2x + 1$ from the circle $x^2 + y^2 = 2$ is

1. $\frac{5}{6}$
2. $\frac{6}{5}$
3. $\frac{6}{\sqrt{5}}$
4. $\frac{\sqrt{5}}{6}$

Que. 58 Equation of the circle with centre on the y-axis and passing through the origin and (2, 3) is

1. $x^2 + y^2 + 13y = 0$
2. $3x^2 + 3y^2 - 13y = 0$
3. $x^2 + y^2 + 13y + 3 = 0$
4. $6x^2 + 6y^2 - 13y = 0$

Que. 59 If the roots of the equation $ax^2 + bx + c = 0$ are reciprocal to each other, then

1. $a + c = 0$
2. $b = 0$
3. $a - c = 0$
4. None of these

Que. 60 If a, b, c, d are in HP, then

1. $a + b > c + d$
2. $a + c > b + d$
3. $a + d > b + c$
4. None of these

Que. 61 If a U-238 nucleus splits into two identical parts, the two nuclei so produced will be

1. radioactive
2. stable
3. Isotope
4. Isobar

Que. 62 Hydrogen will not reduce heated

1. CuO
2. Fe_2O_3

3. Al_2O_3
4. SnO_2

Que. 63 Aluminium surface are often 'anodized'. This means the deposition of a layer of

1. chromium oxide
2. aluminium oxide
3. nickel oxide
4. zinc oxide

Que. 64 The most likely pH of an aqueous solution of sodium salt and ethyl alcohol is

1. 3
2. 5
3. 7
4. 9

Que. 65 An element M has a atomic mass 19 and atomic number 9. Its ion is represented as

1. M^+
2. M^{2+}
3. M^-
4. M^{2-}

Que. 66 Which one of the following is the oxidation state of oxygen in OF_2 ?

1. +2
2. -2
3. +1
4. -1

Que. 67 Which of the following substances can be used for identifying an acid solution?

1. NaCl
2. KNO_3
3. Na_2CO_3
4. K_2SO_4

Que. 68 By which process Ethane can be obtained from Hexane?

1. Addition
2. Cracking
3. Substitution
4. Polymerisation

Que. 69 Benzene reacts with chlorine in the presence of an iron catalyst to produce

1. benzene hexachloride
2. benzyl chloride
3. chlorobenzene
4. benzoyl chloride

Que. 70 Which one of the following sets of chemical elements belong to the same period?

1. He, Ne, Ar
2. Ni, Cu, Zn
3. Cl, Br, I
4. Na, Cu, Mg

Que. 71 Which of the following metals does not form amalgams?

1. Zinc
2. Copper
3. Magnesium
4. Iron

Que. 72 Which of the following notation represents an isotope?

1. $^{39}K_{19}$
2. $^{23}Na_{11}$
3. $^{14}N_{7}$
4. $^{14}C_{6}$

Que. 73 The ratio in the weight by which carbon and oxygen combine in a molecule of carbon monoxide is

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

Que. 74 Equal volumes of all gases under the same temperature nd pressure contain equal number of molecules, according to

1. Avogadro's law
2. Charle's law
3. Boyle's law
4. Graham's law

Que. 75 The major portion of combustible part of gobar gas is

1. Methane
2. Ethane
3. Ethylene
4. Acetylene

Que. 76 Regarding the atom of a chemical element, the magnetic quantum number refers to

1. orientation
2. shape
3. size
4. spin

Que. 77 The presence of which one of the following in the atmosphere causes acid rain?

1. Oxides of lead
2. Oxides of carbon
3. Oxides of sulphur
4. Hydrocarbon

Que. 78 The stones formed in human kidney consist mostly of

1. calcium oxalate
2. sodium acetate
3. magnesium sulphate
4. calcium

Que. 79 Most of the explosions in mines occur due to the mixing of

1. Hydrogen with oxygen
2. Oxygen with acetylene
3. Methane with air
4. Carbon dioxide with ethane

Que. 80 Which one of the following materials is very hard and very ductile?

1. Carborundum
2. Tungsten
3. Cast iron
4. Nichrome

Que. 81 **Directions: Read the sentences carefully and choose suitable prepositions for the purpose.**
She is proud _____ her beauty.

1. at
2. on
3. of

4. about

Que. 82 **Directions: Read the sentences carefully and choose suitable prepositions for the purpose.**

They have invited us _____ attend the function.

1. for
2. to
3. upto
4. at

Que. 83 **Directions: Read the sentence carefully and choose suitable preposition for the purpose.**

We offer the heartiest congratulation _____ your success.

1. at
2. on
3. upon
4. for

Que. 84 **Directions: Read the sentence carefully and choose suitable preposition for the purpose.**

He entered _____ the gate without any difficulty

1. through
2. from
3. in
4. into

Que. 85 **Directions: Read the sentences carefully and choose suitable prepositions for the purpose.**

This usually tends _____ crumble in the face of the smallest challenge.

1. for
2. to
3. upto
4. at

Que. 86 **Directions: Write Synonym of the word given in CAPITAL letters.**

BELITTLE

1. disparage
2. mock
3. diminish
4. shrink

Que. 87 **Direction: In the following question, out of the four alternatives, select the word similar in meaning to the given word.**

WEIRD

1. Unnatural
2. Supernatural
3. Hastily
4. Ghost

Que. 88 **Directions: Write Synonyms of words given in CAPITAL letters.**

REMEDY

1. treatment
2. cure
3. redress
4. restorative

Que. 89 **Select the most appropriate synonym of the given word.**

DAMSEL

1. spinster
2. maiden
3. bitch
4. witch

Que. 90 **Directions: Write Synonyms of words given in CAPITAL letters.**

VAGABOND

1. wanderer
2. beggar
3. tramper
4. traveller

Que. 91 Among the following, which was the capital of Raja Ranjit Singh's kingdom?

1. Amritsar
2. Peshawar
3. Lahore
4. Multan

Que. 92 The Pallavas built Temples at which of the following places?

1. Seringapatnam
2. Madurai
3. Mahabalipuram
4. Halebid

Que. 93 The brightest planet seen from the Earth

1. Pluto

2. Satum
3. Neptune
4. Venus

Que. 94 The longest river in the world is the

1. Nile
2. Amazon
3. Brahmaputra
4. Congo

Que. 95 A solar eclipse occurs when

1. the moon comes between the sun and the earth
2. the earth comes between the sun and the moon
3. the sun comes between the earth and the moon
4. the sun, the moon and the earth are not in the same line

Que. 96 After a shower of rain, a rainbow is seen

1. towards the sun
2. opposite to the sun
3. anywhere, irrespective of the position of the sun
4. even in the absence of the sun

Que. 97 Who in the Vice Chairman of Niti Ayog?

1. Dr. Rajiv Kumar
2. Dr. Arvind Pangaria
3. N K. Singh
4. None of these

Que. 98 In which of the following states river Ganga does **not flow**?

1. Bihar
2. Chattisgarh
3. West Bengal
4. Jharkhand

Que. 99 Who won the Women World Badminton Championship-2019?

1. Saina Nehwal
2. Nozomi Okuhara
3. P V Sindhu
4. None of these

Que. 100 On 150th anniversary of Mahatma Gandhi, which movement is to start?

1. No tree felling
2. No smoking
3. No plastic use
4. No diesel car