9th AHMED BIN ABOOD MEMORIAL
State Level Physics-Maths Knowledge Test-2019
Organized by

Department of Physics ***Department of Mathematics***

Milliya Arts, Science and Management Science College, BEED

Max. Marks: 50 **29-01-2019** **Time: 60 min**

Instructions:-

- All the questions carry equal marks.
- Mobile and Calculators are not allowed.
- Student must write his/her names, college name and allotted seat number on the response sheet provided.
- Student must stick the answer in the prescribed response sheet by completely blacken the oval with black/blue pen only.

Incorrect Method ◯ ⊗ ⊕ Correct Method ●

Section A

1) The atmosphere is held to the earth by ……..

(a) winds (b) gravity (c) clouds (d) nature

2) A player throws a ball upwards with an initial speed of 30 m/s. To what height does the ball rise ?

(a) 30 m (b) 45 m (c) 90 m (d) 100 m

3) The centre of mass of a rigid body cannot lie …….

(a) inside the body always (b) outside the body always

(c) always on its surface (d) at two points

4) A stretched rubber has …….

(a) increased kinetic energy (b) increased potential energy

(c) decreased kinetic energy (b) decreased potential energy

5) If the liquid is rising in a capillary, then angle of contact is ……..

(a) acute (b) obtuse (c) 180^0 (d) 90^0

6) The well known example of longitudinal wave is …..

(a) sound waves (b) light waves (c) wireless waves (d) water waves

7) The waves which cannot travel in vacuum are …..

(a) x-rays (b) radio-waves (c) infrasonic waves (d) ultraviolet rays

8) The de Broglie wavelength is given by ….

(a) $p = \frac{2\pi\hbar}{\lambda}$ (b) $p = \frac{\hbar}{2\lambda}$ (c) $p = \frac{2\pi}{\hbar\lambda}$ (d) $p = \frac{2\pi}{\lambda}$

9) The example of forced vibration is ……

(a) resonance (b) beats (c) interference (d) diffraction

10) An ideal heat engine exhausting heat at 77^0C is to have a 30% efficiency. It must take heat at

(a) 127^0C (b) 327^0C (c) 227^0C (d) 673^0C

11) Monochromatic light has ….

(a) same wavelength (b) different wavelength (c) same speed (d) different speed

12) The wave theory of light does not explain

(a) interference (b) refraction (c) compton effect (d) diffraction

13) Dielectrics are …..

(a) conducting substances (b) non-conducting substances

(c) combustible substances (d) preservative substances

14) In a meter bridge, copper strips are used to …..

(a) decrease contact resistance (b) reduce thermoelectric effect

(c) increase grip of wire (d) none of these

15) To convert a moving coil galvanometer into an ammeter, one needs to connect a …..

(a) small resistance in series (b) small resistance in parallel

(c) large resistance in series (d) large resistance in parallel

16) Most of the substances show which of the following types of magnetism?

(a) paramagnetism (b) ferromagnetism

(c) diamagnetism (d) both diamagnetism and ferromagnetism

17) The frequency of A.C. mains in India is …..

(a) 30 Hz (b) 50 Hz (c) 60 Hz (d) 120 Hz

18) Concept of displacement current was introduced by ….

(a) Ampere (b) Faraday (c) Maxwell (d) Lamy

19) Photoelectric effect is not produced by which radiation…..

(a) ultraviolet (b) x-rays (c) γ-rays (d) radio waves

20) The Nobel Prize in Physics for 2018 was awarded to …..

(a) Oliver Hart and Bengt Holmstrom

(b) Jean-Pierre Sauvage, Sir J. Fraser Stoddart and Bernard L. Feringa

(c) David J. Thouless, F. Duncan M. Haldane and J. Michael Kosterlitz

(d) Arthur Ashkin Gérard Mourou and Donna Strickland

21) If wavelength of a wave is $\lambda = 6000\ A^0$, then wave number will be

(a) $1.66 \times 10^7\ m^{-1}$ (b) $1.66 \times 10^6\ m^{-1}$ (c) $16.7 \times 10^7\ m^{-1}$ (d) $16.6 \times 10^8\ m^{-1}$

22) When used in a circuit, zener diode is always ….

(a) forward biased (b) reverse biased

(c) both forward & reverse (d) connected in series

23) Solar cell produces photo voltage when incident light has energy …

(a) equal to band gap energy (b**)** greater than band gap energy

(c) less than band gap energy (d) greater or equal to band gap energy

24) The space wave communication is utilized in ….

(a) television communication (b**)** radar communication

(c) microwave communication (d) all of these

25) If α- current gain of a transistor is 0.98. What is the value of β- current gain of the transistor?

(a) 0.49 (b) 4.9 (c) 49 (d) 5

Section B

26) *If m_1 and m_2 be the slopes of two perpendicular lines then*

$(a) m_1 + m_2 = 1$ $(b) m_1 - m_2 = 1$ $(c)\ m_1.m_2 = -1$ $(d)\ m_1.m_2 = 0$

27) $n_{c_r} + n_{c_{r-1}} = \cdots$

$(a) n_{c_r}$ $(b)\ n_{c_{r+1}}$ $(c) n_{c_{r-1}}$ $(d)\ n + 1_{c_r}$

28) $\begin{vmatrix} b+c & c & b \\ c & c+a & a \\ b & a & a+b \end{vmatrix} = \cdots$

$(a) 4abc$ $(b) 2abc$ $(c) -2abc$ $(d)\ 0$

29) $1^2 + 2^2 + 3^2 + \cdots . + n^2 = \cdots \cdot$

$(a)\frac{n(n+1)}{2}$ $(b)\frac{n(n+1)(2n+1)}{6}$ $(c)\frac{n^2(n^2+1)}{2}$ $(d)\ \frac{n^2(n^2-1)}{2}$

30) *If A is a singular matrix , then AdjA is …*

(a) *singular* (b)*non singular* (c)*symmetric* (d)*not defined*

31) *The number of elements of the power set of a set containing n elemnts is …*

$(a)2^{n-1}$ $(b)2^{n+1}$ $(c)2^n - 1$ $(d)\ 2^n$

32) *If* $f(x) = \frac{x}{\sqrt{1-x^2}}$, $g(x) = \frac{x}{\sqrt{1+x^2}}$ *then* $(fog)(x) = \cdots$

$(a)\ \frac{x}{\sqrt{1-x^2}}$ $(b)\ x$ $(c)\ \frac{x}{\sqrt{1+x^2}}$ $(d)\ x^2$

33) *Which of the following is the empty set?*

$(a)\{x; x$ *is a real number and* $x^2 - 1 = 0\}$ $(b)\{x; x$ *is a real number and* $x^2 + 1 = 0\}$

$(c)\{x; x$ *is a real number and* $x^2 - 9 = 0\}$ $(d)\{x; x$ *is a real number and* $x^2 = x + 2\}$

34) *The equations* $2x + y = 5, x + 3y = 5, x - 2y = 0$ *have*

(a)*no solution* (b)*one solution* (c)*two solutions* (d) *infinitely many solutions*

35) $\lim_{x\to 0} \frac{sinx}{e^x - 1} = \cdots .$

$(a)\ 1$ $(b)0$ $(c)\ e$ $(d)\ e^2$

36) *The slope of the line* $3x + 2y = 5$ *is ….*

$(a)\frac{2}{3}$ $(b)\ \frac{3}{2}$ $(c)\ \frac{5}{3}$ $(d)\ \ -\frac{3}{2}$

37) *If the sum of first n even natural numbers is* 420, *then the value of n is …*

$(a)16$ $(b)18$ $(c)20$ $(d)\ 22$

38) *Which of the following trigonometric identity is wrong?*

$(a)tan2x = \frac{tanx}{1-\tan^2 x}$ $(b)\ sin2x = \frac{2tanx}{1+\tan^2 x}$

$(c)\ \sin(-x) = -sinx$ $(d)\ \sin\left(\frac{\pi}{2} + x\right) = \ cosx$

39) *If the equation* $2x^2 - 10x + k = 0$ *has real and equal roots, then* $k = \cdots$

$(a)\frac{5}{2}$ $(b)\frac{25}{2}$ $(c)\ 5$ $(d)\ \ -\frac{5}{2}$

40) $\lim_{n\to\infty}[\frac{1}{1-n^2}+\frac{2}{1-n^2}+\frac{3}{1-n^2}+\cdots+\frac{n}{1-n^2}]=\cdots$

$(a)\ \frac{1}{2}$ $(b)\ -\frac{1}{2}$ $(c)\ 1$ $(d)\ 0$

41) $If\ y=cosx^2, then\ \frac{dy}{dx}=\cdots$

$(a)\ sinx^2$ $(b)-\ sinx^2$ $(c)2xsinx^2$ $(d)-\ 2x\ sinx^2$

42) $Determine\ the\ order\ and\ degree\ of\ the\ differential\ equation$

$2x\frac{d^4y}{dx^4}+5x^2(\frac{dy}{dx})^3-xy=0$

$(a)\ fourth\ order, first\ degree$ $(b)\ third\ order, first\ degree$

$(c) first\ order, fourth\ degree$ $(d)\ first\ order, third\ degree$

43) $\int e^{\log(sinx)})dx=\cdots$

$(a)\ sinx+c$ $(b)\ e^{\log(cosx)})$ $(c)-\ cosx+c$ $(d)\ None\ of\ these$

44) $The\ centre\ of\ the\ circle\ x^2+(y-1)^2=2\ \ is\ \ldots$

$(a)(1,2)$ $(b)\ (0,1)$ $(c)(0,-1)$ $(d)\ (1,\sqrt{2}\ )$

45) $The\ probability\ that\ a\ prime\ number\ selected\ at\ random\ from\ the\ numbers$

$(1,2,3,\ldots 35)\ is\ \ldots.$

$(a)\frac{12}{35}$ $(b)\frac{11}{35}$ $(c)\frac{13}{35}$ $(d)\ None\ of\ these$

46) $If\ \ \vec{c}=3\vec{a}-2\vec{b}, then\ \vec{a}.(\vec{b}\times\vec{c})=\cdots$

$(a)-3$ $(b)\ \ 1$ $(c)\ \ 3$ $(d)\ 0$

47) $The\ direction\ cosines\ of\ X-axis\ are\ \ldots$

$(a)0,0,1$ $(b)1,1,1$ $(c)1,0,0$ $(d)\ 1,0,1$

48) $The\ domain\ of\ the\ function\ y=\sqrt{8-x}\ is:$

$(a)(-\infty,\ 8]$ $(b)(-8,\ 8)$ $(c)[-8,\ 8]$ $(d)\ None\ of\ these$

49) $If\ \ z=\ 4-5i\ \ then\ \ |z|=\cdots$

$(a)-9$ $(b)\sqrt{41}$ $(c)41$ $(d)\ -41$

50) $The\ equation\ of\ the\ \ director\ circle\ of\ the\ circle\ x^2+y^2=100\ is\ \ldots$

$(a)\ x^2+y^2=10$ $(b)x^2-y^2=10$ $(c)x^2-y^2=100$ $(d)\ \ x^2+y^2=200$