Padasalai's Telegram Groups!

(தலைப்பிற்கு கீழே உள்ள லிங்கை கிளிக் செய்து குழுவில் இணையவும்!)

- Padasalai's NEWS - Group

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- Padasalai's Channel - Group

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- Lesson Plan - Group

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- 12th Standard - Group

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- 9th Standard - Group

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- 6th to 8th Standard - Group

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- 1st to 5th Standard - Group

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Std : XII

Date : 16.09.2019

SLIP TEST

MATHS

Marks: 40

Time : 1.00 hr

I. Choose the correct answer: (10 x 1 = 10)

1. If $\vec{a}$ and $\vec{b}$ are parallel vectors, then $[\vec{a}, \vec{c}, \vec{b}]$ is equal to
   1) 2 2) -1 3) 1 4) 0
2. The volume of the parallelepiped with its edges represented by the vectors $\hat{\imath} + \hat{\jmath}, \hat{\imath} + 2\hat{\jmath}, \hat{\imath} + \hat{\jmath} + \pi\hat{k}$ is
   1) $\frac{\pi}{2}$ 2) $\frac{\pi}{3}$ 3) π 4) $\frac{\pi}{4}$
3. If $\vec{a} = \hat{\imath} + \hat{\jmath} + \hat{k}, \vec{b} = \hat{\imath} + \hat{\jmath}, \vec{c} = \hat{\imath}$ and $(\vec{a} \times \vec{b}) \times \vec{c} = \lambda\vec{a} + \mu\vec{b}$, then the value of $\lambda + \mu$ is
   1) 0 2) 1 3) 6 4) 3
4. If the volume of the parallelepiped with $\vec{a} \times \vec{b}, \vec{b} \times \vec{c}, \vec{c} \times \vec{a}$ as coterminous edges is 8 cubic units, then the volume of the parallelepiped with $(\vec{a} \times \vec{b}) \times (\vec{b} \times \vec{c}), (\vec{b} \times \vec{c}) \times (\vec{c} \times \vec{a})$ and $(\vec{c} \times \vec{a}) \times (\vec{a} \times \vec{b})$ as coterminous edges is,
   1) 8 cubic units 2) 512 cubic units 3) 64 cubic units 4) 24 cubic units
5. If $\vec{a} \times (\vec{b} \times \vec{c}) = (\vec{a} \times \vec{b}) \times \vec{c}$, where $\vec{a}, \vec{b}, \vec{c}$ are any three vectors such that $\vec{b} \cdot \vec{c} \neq 0$ and $\vec{a} \cdot \vec{b} \neq 0$, then $\vec{a}$ and $\vec{c}$ are
   1) Perpendicular 2) parallel
   3) inclined at an angle $\frac{\pi}{3}$ 4) inclined at an angle $\frac{\pi}{6}$
6. If $\vec{a} = 2\hat{\imath} + 3\hat{\jmath} - \hat{k}, \vec{b} = \hat{\imath} + 2\hat{\jmath} + -\hat{k}, \vec{c} = 3\hat{\imath} + 5\hat{\jmath} - \hat{k}$, then a vector perpendicular to $\vec{a}$ and lies in the plane containing $\vec{b}$ and $\vec{c}$ is
   1) $-17\hat{\imath} + 21\hat{\jmath} - 97\hat{k}$ 2) $17\hat{\imath} + 21\hat{\jmath} - 123\hat{k}$ 3) $-17\hat{\imath} - 21\hat{\jmath} + 97\hat{k}$ 4) $-17\hat{\imath} - 21\hat{\jmath} - 97\hat{k}$
7. The coordinates of the point where the line $\vec{r} = (6\hat{\imath} - \hat{\jmath} - 3\hat{k}) + t(-\hat{\imath} + \hat{\jmath} + 4\hat{k})$ meets the plane $\vec{r}.(\hat{\imath} + \hat{\jmath} + \hat{k}) = 3$ are
   1) (2,1,0) 2) $(7, -1, -7)$ 3) $(1,2,-6)$ 4) $(5, -1, 1)$
8. If the direction cosines of a line are $\frac{1}{c}, \frac{1}{c}, \frac{1}{c}$, then
   1) $c = \pm 3$ 2) $c = \pm\sqrt{3}$ 3) $c > 0$ 4) $0 < c < 1$

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9. If the distance of the point (1, 1,1) from the origin is half of its distance from the plane x+y+z+k =0 , then the values of k are

1) ± 3 2) ± 6 3) $-3,9$ 4) $3,-9$

10. If the length of the perpendicular from the origin to the plane $2x+3y+\lambda z=1$, $\lambda > 0$ is $\frac{1}{5}$, then the value o

1) $2\sqrt{3}$ 2) $3\sqrt{2}$ 3) 0 4) 1

II. Answer the following questions: **(3 x 2 = 6)**

11. Show that the lines $\frac{x-2}{1}=\frac{y-3}{1}=\frac{z-4}{3}$ and $\frac{x-1}{-3}=\frac{y-4}{2}=\frac{z-5}{1}$ are coplanar. Also, find the plane containing these lines.

12. If the straight lines $\frac{x-1}{1}=\frac{y-2}{2}=\frac{z-3}{m^2}$ and $\frac{x-3}{1}=\frac{y-2}{m^2}=\frac{z-1}{2}$ are coplanar, find the distinct real values of m.

13. If the straight lines $\frac{x-1}{1}=\frac{y+1}{\lambda}=\frac{z}{2}$ and $\frac{x+1}{5}=\frac{y+1}{2}=\frac{z}{\lambda}$ are coplanar, find λ and equations of the planes containing these two lines.

III. Answer the following questions: **(3 x 3 = 9)**

14. Find the non – parametric form of vector equation, and Cartesian equation of the plane passing througl the point(0,1,-5) and parallel to the straight lines $\vec{r}=(\hat{\imath}+2\hat{\jmath}-4\hat{k})+s(2\hat{\imath}+3\hat{\jmath}+6\hat{k})$ and $\vec{r}=(\hat{\imath}-3\hat{\jmath}+5\hat{k})+t(\hat{\imath}+\hat{\jmath}-\hat{k})$.

15. Verify whether the line $\frac{x-3}{-4}=\frac{y-4}{-7}=\frac{z+3}{12}$ lies in the plane $5x-y+z=8$.

16. Find the parametric form of vector equation, and Cartesian equations of the plane passing through the points (2,2,1), (9,3,6) and perpendicular to the plane $2x+6y+6z=9$.

IV. Answer the following questions: **(3 x 5 = 15)**

17. Find the parametric vector, non – parametric vector and Cartesian form of the equations of the plane passing through the three non-collinear points (3,6,-2), (-1,-2,6),and (6,-4,-2).

18. Show that the lines $\vec{r}=(-\hat{\imath}-3\hat{\jmath}-5\hat{k})+s(3\hat{\imath}+5\hat{\jmath}+7\hat{k})$ and $\vec{r}=(2\hat{\imath}+4\hat{\jmath}+6\hat{k})+t(\hat{\imath}+4\hat{\jmath}+7\hat{k})$ are coplanar. Also, find the non – parametric form of vector equation of the plane containing these lines.

19. Find the non- parametric form of vector equation and Cartesian equation of the plane passing through the point(1,-2,4) and perpendicular to the plane $x+2y-3z=11$ and parallel to the line $\frac{x+7}{3}=\frac{y+3}{-1}=\frac{z}{1}$.

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[illegible]

Std : XII **SLIP TEST** **Marks : 40**

Date : 04.11.2019 **MATHS** **Time : 1 hr**

I. Choose the correct answer: **(10 x 1 = 10)**

1. The percentage error of fifth root of 31 is approximately how many times the percentage error in 31?
   a) $\frac{1}{31}$ b) $\frac{1}{5}$ c) 5 d) 31
2. If $v(x,y) = \log(e^x + e^y)$, then $\frac{\partial v}{\partial x} + \frac{\partial v}{\partial y}$ is equal to
   a) $e^x + e^y$ b) $\frac{1}{e^x+e^y}$ c) 2 d) 1
3. If $f(x,y) = e^{xy}$, then $\frac{\partial^2 f}{\partial x \partial y}$ is equal to
   a) xye^{xy} b) $(1+xy)\,e^{xy}$ c) $(1+y)e^{xy}$ d) $(1+x)e^{xy}$
4. If $f(x,y,z) = xy + yz + zx$, then $f_x - f_z$ is equal to
   a) z – x b) y – z c) x – z d) y – x
5. If $u(x,y) = x^2 + 3xy + y - 2019$, then $\frac{\partial u}{\partial x}\Big|_{(4,-5)}$ is equal to
   a) - 4 b) – 3 c) - 7 d) 13
6. If we measure the side of a cube to be 4 cm with an error of 0.1 cm, then the error in our calculation of the volume is
   a) 0.4 cu.cm b) 0.45 cu.cm c) 2 cu.cm d) 4.8 cu.cm
7. The approximate change in the volume V of a cube of side x metres caused by increasing the side by 1% is
   a) $0.3xdx\ m^3$ b) $0.03x\ m^3$ c) $0.03\ x^2\ m^3$ d) $0.03\ x^3\ m^3$
8. If $g(x,y) = 3x^2 - 5y + 2y^2$, $x(t) = e^t$ and $y(t) = \cos t$, then $\frac{dg}{dt}$ is equal to
   a) $6e^{2t} + 5\sin t - 4\cos t \sin t$ b) $6e^{2t} - 5\sin t + 4\cos t \sin t$
   c) $3e^{2t} + 5\sin t + 4\cos t \sin t$ d) $3e^{2t} - 5\sin t + 4\cos t \sin t$
9. The change in the surface area $S = 6x^2$ of a cube when the edge length varies from x_0 to $x_0 + dx$ is
   a) $12x_0 + dx$ b) $12x_0 dx$ c) $6x_0 dx$ d) $6x_0 + dx$

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10. If $f(x) = \frac{x}{x+1}$, then its differential is given by

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

II. Answer the following questions: **(3 x 2 = 6)**

11. Let $g(x,y) = 2y + x^2, x = 2r - s,\ y = r^2 + 2s, r, s \in R$. Find $\frac{\partial g}{\partial r}, \frac{\partial g}{\partial s}$.

12. If $u(x,y,z) = xy^2z^3,\ x = \sin t,\ y = \cos t,\ z = 1 + e^{2t}$, find $\frac{du}{dt}$.

13. Let $U(x,y,z) = xyz,\ x = e^{-t},\ y = e^{-t}\cos t, z = \sin t,\ t \in R$. Find $\frac{dU}{dt}$.

III. Answer the following questions: **(3 x 3 = 9)**

14. If $z(x,y) = x\ \tan^{-1}(xy),\ x = t^2,\ y = se^t,\ s,t \in R$. Find $\frac{\partial z}{\partial s}$ and $\frac{\partial z}{\partial t}$ at $s = t = 1$.

15. If $u(x,y) = x^2y + 3xy^4,\ x = e^t$ *and* $y = \sin t$, find $\frac{du}{dt}$ and evaluate it at t = 0.

16. If $w(x,y,z) = x^2 + y^2 + z^2, x = e^t, y = e^t \sin t$ and $z = e^t \cos t$, find $\frac{dw}{dt}$.

IV. Answer the following questions: **(3 x 5 = 15)**

17. $W(x,y,z) = xy + yz + zx,\ x = u - v,\ y = uv,\ z = u + v,\ u, v \in R$. Find $\frac{\partial W}{\partial u}, \frac{\partial W}{\partial v}$, and evaluate them at $\left(\frac{1}{2}, 1\right)$.

18. Verify the above theorem for $F(x,y) = x^2 - 2y^2 + 2xy$ and $x(t) = \cos t, y(t) = \sin t$, $t \in [0, 2\pi]$.

19. Let $g(x,y) = x^2 - yx + \sin(x+y),\ x(t) = e^{3t}, y(t) = t^2,\ t \in R$. Find $\frac{dg}{dt}$.

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