(C2/63)

No. of printed pages: 3

## SARDAR PATEL UNIVERSITY M.Sc. (H.SC) I SEMESTER FBT/FN (New CBCS and ATKT) EXTERNAL THEORY EXAMINATION

MONDAY, DATE: 03/12/12 TIME: 10.30AM TO 1.30 PM

PH01CFBT02/PH01CFDN02: BASIC BIOCHEMISTRY

Total Marks: 70

Note: 1) All the questions are compulsory.

- 2) Figures on the right indicate marks
- 3) Draw figures where ever necessary.

I. Choose the correct answer from the following

(8)

- 1. After being formed by the ribosomes located on the endoplasmic reticulum, what is the next organelle to which a protein could be transported?
  - a.mitochondria
  - b.smooth endoplasmic reticulum
  - c. Golgi apparatus
  - d.nucleus
- 2. Which statement is NOT true about bacteria?
  - a. Their cell wall is made of a slime layer that is the same as in plant cell walls.
  - b. Some are motile due to flagella.
  - c. They are all prokaryotes.
  - d. They have a cell wall that contains peptidoglycan.
- 3. Which of the following step is not involved in substrate level phosphorylation?
  - a. Dihydroxyacetone phosphate Glyceraldehyde- 3-phosphate.
  - b. 1,3- diphosphoglycerate 3-phosphoglycerate.
  - c. Succinyl CoA Succinate.
  - d. Phosphoenol pyruvate pyruvate.
- 4. Which of the following statements is not true of HMP shunt pathway?
  - a. CO2 is not produced in it.
  - b. NADPH is produced.
  - c. Pentoses are produced.
  - d. Does not produce ATP.

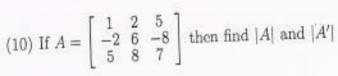
(PTO)

- (10) If  $A = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$  then  $A^2 = \dots$ 
  - (a)  $\begin{bmatrix} 1 & 0 \\ 1 & 0 \end{bmatrix}$  (b)  $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$  (c)  $\begin{bmatrix} 1 & 4 \\ 0 & 1 \end{bmatrix}$  (d)  $\begin{bmatrix} 1 & 0 \\ 2 & 1 \end{bmatrix}$

Que.2 Attempt the following.(any ten)

20

- (1) Evaluate  $\lim_{x\to 0} \frac{\log(\sin 2x)}{\log(\sin x)}$
- (2) Evaluate  $\lim_{x\to 0} \frac{\log(\sin x)}{\cot x}$
- (3) Evaluate  $\lim_{x\to 0} \frac{x \tan x}{x^3}$
- (4) If  $u = \log(x^2 + y^2)$  then prove that  $\frac{\partial^2 u}{\partial x \partial y} = \frac{\partial^2 u}{\partial y \partial x}$
- (5) Check whether the function u = sin<sup>-1</sup> (z/y) + tan<sup>-1</sup> (y/x) is homogeneous or not?
- (6) Prove that  $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$  for  $u = e^{ay} \cos ax$
- (7) If A and B both are symmetric matrices then prove that AB is symmetric iff A and B commute.
- (8) If  $A=\begin{bmatrix}2&1\\-1&-1\end{bmatrix}$  ,  $B=\begin{bmatrix}2&-3\\-3&1\end{bmatrix}$  and C=A+B then find  $C_{21}$  and  $C_{22}$ .
- (9) Define Column matrix and Unit matrix with example.



(11) If 
$$A = \begin{bmatrix} 1 & -1 \\ 2 & 3 \end{bmatrix}$$
 then find  $A^2 - 4A + 5I$ 

(12) Define Characteristic matrix and Characteristic equation of matrix with example.

with example.

Que.3 [A] Find a,b and c for which 
$$\lim_{x\to 0} \frac{ae^x - 2b\cos x + 3ce^{-x}}{x\sin x} = 2$$

5

[B] Evaluate 
$$\lim_{x\to 0} \frac{\log(\log(1-3x^2))}{\log(\log(\cos 2x))}$$
 5

Que.3 [C] Evaluate 
$$\lim_{x\to 0} \frac{e^x + \log(1-x) - 1}{\tan x - x}$$

[D] Evaluate 
$$\lim_{x\to 0} \left(\frac{1}{\sin^2 x} - \frac{1}{x^2}\right)$$
 5

Que.4 [A] Find 
$$x^2 \frac{\partial^2 z}{\partial x^2} + 2xy \frac{\partial^2 z}{\partial x \partial y} + y^2 \frac{\partial^2 z}{\partial y^2}$$
 for  $z = x^n \log \frac{y}{x}$  5

[B] If 
$$u = \sqrt{x^2 + y^2}$$
 then find  $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2}$ 
OR

[D] If 
$$z = f(x, y)$$
,  $x = r \cos \theta$ ,  $y = r \sin \theta$  then prove that

$$\left[\frac{\partial z}{\partial x}\right]^2 + \left[\frac{\partial z}{\partial y}\right]^2 = \left[\frac{\partial z}{\partial r}\right]^2 + \frac{1}{r^2} \left[\frac{\partial z}{\partial \theta}\right]^2$$

Que.5 [A] If 
$$A = \begin{bmatrix} 2+i & 3-i & 4+5i \\ 1+3i & 2i & 5-6i \\ 3+i & 6-5i & 1+i \end{bmatrix}$$
 then find  $(\overline{A})'$  and  $A + A^{\theta}$  5

[B] If 
$$\begin{bmatrix} 2 & -1 & x \\ 3 & y & z \end{bmatrix} + 3 \begin{bmatrix} x & y & 2 \\ 0 & -1 & 3 \end{bmatrix} = \begin{bmatrix} 5 & 8 & 7 \\ 3 & 0 & 11 \end{bmatrix}$$
, then find x and y.