DEEPER LIFE CAMPUS FELLOWSHIP

FEDERAL UNIVERSITY OF AGRICULTURE ABEOKUTA

2017/18 MOCK CAT   **16th June 2018**

COURSE CODE: **MTS 105**

Answer All Questions   **Time: 20 mins**

1. Let S = [1,3,5,7,9], T = [xϵZ: $x^3 - 6x^2 + 11x - 6 = 0$] then SnT is

   (a) [1,3]   (b) [2,5,7]   (c) [1,3,9]   (d) [5,9]

2. In a class of 40 students, each student at least offers one of physics and chemistry. If the number of students that offers Physics is three times the number that offer chemistry. Find the number of students that offer Physics only

   (a) 25   (b) 10   (c) 15   (d) 5

3. Simplify $\sqrt{48} - \sqrt{3} + \sqrt{75}$

   (a) $5\sqrt{3}$ (b) $6\sqrt{3}$ (c) $8\sqrt{3}$ (d) $18\sqrt{3}$

4. Simplify $\sqrt{50} - \sqrt{18} + \sqrt{32}$

   (a) $2\sqrt{6}$ (b) $\sqrt{2}$ (c) $6\sqrt{2}$ (d) $\sqrt{6}$

5. What is the remainder when $2x^2$ + 6x-8 is divided by (x-1)

   (a) 0   (b) -1   (c) 1   (d) -2

6. Find a if (x-2) is a factor of ax^2-12x+4

   (a) 5   (b) 6   (c) -6   (d) -5

7. If (x-2) and (x+1) are factors of x^3-3x-2=0. Find the third

   (a) x-1   (b) x+2   (c) x-2   (d) x+1

8. factorize a³+a²+a+1

   (a) a(a²+a+1)   (b) (a²+1)(a+1)   (c) a(a+1)(a-1)   (d) (a²+1)(a²+1)

9. Resolve $\dfrac{3x^2}{1+x^3}$ into Partial Fraction

   (a) $\dfrac{1}{1+x} + \dfrac{2x-1}{1-x+x^2}$ (b) $\dfrac{1}{1+x} + \dfrac{3x}{1+x+x^2}$ (c) $\dfrac{2}{2+x} + \dfrac{2}{1-x+x^2}$ (d) $\dfrac{1}{x-1} + \dfrac{2}{1-x+x^2}$

10. Resolve $\dfrac{1}{x^4+5x^2+6}$ into partial fraction

    (a) $\dfrac{x+1}{x^2-2} + \dfrac{x-1}{x^3+3}$ (b) $\dfrac{x+2}{x^2-2} - \dfrac{x-3}{x^2+3}$ (c) $\dfrac{1}{x^2-2} + \dfrac{-1}{x^2+3}$ (d) $\dfrac{-1}{x^2-2} + \dfrac{-2}{x^2+3}$

11. Express $\dfrac{1}{x^3-1}$ in partial fraction

    (a) $\dfrac{1}{3}\left[\dfrac{1}{x-1} - \dfrac{x+2}{x^2+x+1}\right]$ (b) $\dfrac{1}{3}\left[\dfrac{1}{x-1} - \dfrac{x-2}{x^2+x+1}\right]$ (c) $\dfrac{1}{3}\left[\dfrac{1}{x-1} - \dfrac{x-2}{x^2-x+1}\right]$ (d) $\dfrac{1}{3}\left[\dfrac{1}{x-1} - \dfrac{x+2}{x^2+x+1}\right]$

12. If α and β are the roots of the equation 3x²-4x+5=0. Find the value of $\dfrac{\alpha}{\beta} + \dfrac{\beta}{\alpha}$

    (a) $\dfrac{46}{15}$ (b) $\dfrac{16}{15}$ (c) $\dfrac{-14}{15}$ (d) $\dfrac{-6}{15}$

13. Find the sum of 17 terms of the series 49,44,39……….

    (a) 153   (b) 207   (c) 192   (d) 149

14. Find the geometric means between 81 and 1

    (a) 18, 27, 72   (b) 3, 9, 27   (c) 3, 9, 36   (d) 27, 9, 3

15. If the 6th term of an A.P is 11 and first term is 1. Find the common difference

    (a) $\dfrac{12}{5}$ (b) $\dfrac{5}{3}$ (c) -2   (d) 2

16. Find the coefficient of x^6 in the binomial expansion of $\left[\dfrac{1}{2} + x\right]^8$

    (a) 28   (b) 8   (c) 7   (d) 4

17. Find the coefficient of x^5 in $(2x - 1)^8$

    (a) -1792   (b) 896   (c) 448   (d) -896

18. Use pascal triangle to evaluate $(1.002)^5$ correct to six decimal places

    (a) 1.000100   (b) 1.001004   (c) 1.010040   (d) 1.100040

19. Solve the equation x³-5x²-x+5=0

    (a) -1,1,5   (b)-1,-1,5   (c) 1,-1,-5   (d) -1,-1,-5

20. Find the coefficient of x²y² in the expansion $(2x + 3y)^4$

    (a) 36   (b) 81   (c) 96   (d) 216

BIO 101

Answer All Questions   **Time: 15mins**

1. **The six classes of fungi are -----------------,--------------,-------------,------------,-----------,--------------**
2. **Plants that manufacture their foods themselves are called ----------------------**
3. **--------------are trees that have scars of shedded leaves on their stems**
4. **The angiosperm plants have -------------------and --------------- systems**
5. **The process of grouping plant is known as -------------------**
6. **-------------,------------,------------,------------- and ----------- are types of fleshy fruits.**
7. **Okra is an example of ----------- dry deliscent fruit**
8. **The 6 classes of phycophyta are the ----------,-------------,----------,-------------,---------,-----------**
9. **The leaf blade is also known as the -------------**
10. **Leaves without petioles are called --------------**
11. **------------are plants with two or more stems developing from the same root on a ground level**
12. **Flowers that develop directly from the stem of the trees are termed ------------- flowers**
13. **---------- is another name for the receptacle**
14. **-------------- are plants that grow mainly on other plant for nutrient but don not deprive them for nutrients**
15. **walls of hyphae are made up of -----------**
16. **------------- is the short segment of a vegetative hyphae**
17. **--------- are short plants with weak stems that grow with their branches well above the ground level**
18. **Based on size, plants can be grouped into ---**
19. **------------- are trees without scars of fallen leaves and are straight**
20. **--------------- are plants that can give without any support**
21. **Plants can be group according to their behavior into ---**
22. *gloroosa superb* **is an example of ----------- climbers**
23. **leaf blades when swollen form --------------**
24. **---------------- margin is exhibited by cashew**
25. **------------- margin is doubly serrated**
26. **Plant get rid of excess water through a process known as -------------**
27. **--------------- are plants that grow in desert or dry places**
28. **Leaf bases in monocots are joined to give a -----------------------------**
29. **--- are general characteristics of angiosperms**
30. **------------------ is also known as the furion of the nucleus.**

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BIO 103

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1. ---------------- and -------------------- are hormones useful in homeostasis
2. **The two types of environment possessed by living things are ------------ and --------------**
3. **The two types of uptake of nutrient are -------------and ------------**
4. ----------------,------------------- and -------------- are the sources of metabolites
5. **Complete the table below**

Organism	Excretory organs
Earthworm	
Protozoans	
Vetebrates	
	Soleloicytes
	Flamecells
Insects	

6. ------------,---------------- and ------------- are 3 steps in respiration
7. ------------ animals pass out their nitrogenous waste product as ammonia
8. **3 major component of DNA is called -------------------------,---------------------- and -----------**
9. **Purines are made up of --------------- while------------------form pyronidines**
10. **Body temperatures are maintained by ---------------- and ------------------- process**
11. **The chemical equation for photosynthesis is -----------------------------**
12. **The kreb's cycle is also known as -------------------**
13. **Hydra undergoes --------------------reproduction by -----------------**
14. **Arthropods shed their old cuticle through a process called ------------------------------------**
15. **Growth is measured in four ways namely; --------------------,----------------,-----------------,-------------------**
16. **Complete the table**

Organism	Type of reproduction	Forms of reproduction
Fisson	**Asexual**	
Fragmentation		
Vetebrates		
	Asexual	**sporulation**

17. **Complete the table below**

Elements	functions
	Chlorophyll formation
	Osmotic formation
Nitrogen	
phosphorous	

18. ---------------- organism generates heat from internal organs
19. ---------------- animals pass out nitrogenous waste products as uric acid
20. ---------------- animals pass out nitrogenous waste products as urea
21. **Oxidation of protein gives ----------------,-------------------- and --------**
22. -------------------- is the only process by which is removed from the atmosphere
23. **Pyruvic acid** (_____) **undergoes oxidative decarboxylation to form ----------------------------**
24. ----------------,-------------------,-------------------------------,------------------ are growth factors
25. **Three characteristics of enzymes are --------------,----------------,---------------------**
26. **The mechanism of actions of metabolism are --------------,------------**
27. ------------------- form of asexual reproduction is common in plasmodium
28. **The internal environment is regulated by ---------------- and ---------------- system**
29. **In excretion -------------------------- are passed out of the body**
30. **The five phases of mitosis are ---------------,------------------,------------------,------------------,-----------**