## 23BCP101

## UG PROGRAM (4 YEARS HONORS) WITH SINGLE MAJOR AT THE END OF FIRST SEMESTER

## ESSENTIALS AND APPLICATIONS OF MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES

(Common for B.Sc. (Mathematics, Statistics, Chemistry, Electronics, Physics, Data Science, Computer Science, Artificial Intelligence and Robotics, Psychology, Internet of Things, Chemistry / Analytical Chemistry, Geology, Geography))

Time: 311ours	(w.e.f. Admitted Batch 2023-24)  Maximum: 70 Marks			
SECTION-A (Multiple Choice Questions)	30x1=30			
1. Find the value of (i) <sup>15</sup>	( )			
(a) $i$ (b) $-i$ (c) 1 (d) $-1$				
2. What is the imaginary part of $\frac{a+bi}{b}$	( )			
(a) -1 (b) 1 (c) a/b (d) $\frac{b}{a^2+b^2}$				
$3. Sin 30^{0} Cos 60^{0} + Cos 30^{0} sin 60^{0}$	( )			
(a) 0 (b) -1 (c) 1 (d) None				
4. If $Sin A = \frac{4}{5}$ What is the value of $tan A$	- ( )			
(a) $\frac{3}{4}$ (b) $\frac{4}{3}$ (c) $\frac{3}{5}$ (d) $\frac{5}{4}$				
5. If $\overline{a} = 3\overline{i} + 2\overline{j} - 2\overline{k}$ and $\overline{b} = 2\overline{i} + 4\overline{j} + 3\overline{k}$ then find $\overline{a}$ . $\overline{b}$	( )			
(a) 8 (b) 6 (c) 7 (d) 0				
6. If $\overline{a} = \overline{i} + \overline{j} + \overline{k}$ and $\overline{b} = 3\overline{i} + 2\overline{j} - \overline{k}$ then find $\overline{a} + 3\overline{b}$	( )			
(a) $2\overline{i} + 3\overline{j} + \overline{k}$ (b) $10\overline{i} + 7\overline{j} - 2\overline{k}$ (c) 0 (d) $\overline{i} + \overline{j} + \overline{k}$				
7. Find the mean of the data 103, 105, 102, 104	( )			
(a) 102 (b) 103 (c) 104 (d) 103.5				
8. Write the relation between mean, median and mode	( )			
(a) Mode = $2 \text{ median} - 3 \text{ mean}$ (b) Mode = $3 \text{ median} - 2 \text{ mean}$				
(c) Mode = $2 \text{ median} + 3 \text{ mean}$ (d) Mode = $3 \text{ median} + 2 \text{ mean}$				
9. Which branch of physics deals with the behavior of matter at the ato	omic and subatomic levels			
	( )			

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10. The rate of change of momentum is called?	
(a) Acceleration(b) Force (c) Work (d) Inertia	30 OF
11. The special theory of relativity was introduced in 1905 by (, )	200
(a) Planck (b) Albert Einstein	
(c) Maxwell (d) Rutherford	, 5,60 at 1
12. Which law talks about "Entropy"?	g per Ski
(a) Zeroth law (b) Second law (c) First law (d) None of these	5 525
13. In which waves particles of the medium vibrates perpendicular to the direction of wave	
4 T	er til
(a) Transverse waves (b) Longitudinal waves	620
(c) Matter waves (d) Both a & b	920 972
14. Which substance particle determines the chemical properties of an element? ( )	co ski
(a) Proton (b) Neutron (c) Electron (d) Alpha particle	920 F
15 What force binds protons and neutrons together in the atomic nucleus?	50 00
(a) Electromagnetic force (b) Gravitational force	0 (d) 020
(c) Strong nuclear force (d) Weak nuclear force	n 070 °24
16. Which sustainable technology focuses on reducing greenhouse emissions and energy	3 180 46
200 524 <b>consumptions?</b> C20 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2	ati kening
consumptions?  (a) Renewable energy sources (b) Recycling  (b) Composing  (c) Composing  (d) sustainable waste management  17 How many unpaired electrons are in the ground-state electron configuration	1000 - 1000 E
(c) Composing (d) sustainable waste management	020 1001
(c) Composing (d) sustainable waste management  17. How many unpaired electrons are in the ground-state electron configuration  1-7. 2-2-6. 2-2. 2-30	20 16
17. How many unpaired electrons are in the ground-state electron configuration  1s <sup>2</sup> 2s <sup>2</sup> 2p <sup>6</sup> 3s <sup>2</sup> 3p <sup>3</sup> ?  (a) 0 (b) 1 (c) 2 (d) 3  18. The reconstite guesties guesties growther specifies?	120 72
(a) 0 (b) 1 (c) 2 (d) 3	520 172
18. The magnetic quantum number specifies:	
(a) The size of the orbital (b) The shape of the orbital (c) The orientation of the orbital (d) The spine of the electron  19. Which of the following is a evidence of a chemical changes? ( )	g 170 32
(a) The orientation of the orbital (d) The enine of the electron	
19, Which of the following is a evidence of a chemical changes?	G1 WY 27
19, Which of the following is a evidence of a chemical changes?  (a) Change in temperature (b) Change in shape  (c) Change in volume (d) Change in density	
(a) Change in temperature (b) Change in shape (c) Change in volume (d) Change in density	Programme and the
22. N. 521 St. Dec. 175 Sept. 175 Se	
(c) Change in volume (d) Change in density	

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20. What is the law of conservation of mass?	
(a) Mass is created during a chemical reaction	
(b) Mass is destroyed during a chemical reaction	
(c) Mass is conserved during a chemical reaction	
(d) Mass is irrelevant during a chemical feaction  21. What is the building block of proteins?	
21. What is the building block of proteins?  (a) Nucleotide (b) Amino acid  (c) Managage barida (d) Eatty acid	
(c)ivionosaccharide (d) i atty delo	
(c) Monosaccharide (d) Fatty acid  22. Which sugar is commonly found in milk?  (a) Glucose (b) Lactose (c) Fructose (d) Sucrose	
(a) Giucose (b) Lactose (c) ructose (d) sucrose	
23. The structure of a protein is often described in how many levels?	
20 20 20 20 20 20 20 20 20 20 20 20 20 2	0 5/5
24. What is the primary function of fats in the body?	75 BON
(a) Energy storage (b) Enzyme catalysis	0 0
(c) Genetic information storage (d)Structural support	50 DZ
(c) Genetic information storage (d)Structural support  25. WWW stands for?	(7) "
25. WWW stands for?  (a) World wide web (b) World Web Wide (a) 22 22 22 22 22 22 22 22 22 22 22 22 22	gzti =
(a) World wide web (b) World Web Wide (c) Organization (d) Website (d) Website	200
(c)Organization (d) Website  26. The server on the internet is also known as a?  (d) Parrecter  (e) Category (d) Parrecter	120
26. The server on the internet is also known as a?  (a) Hub (b) Host (c) Gateway (d) Repeater  27. Internet is a network of which computer network?	0.85
(a) Hub (b) Host (c) Gateway (d) Repeater  27. Internet is a network of which computer network? ( )  (a) All over the state (b) Country (c) World (d) None of these	
(a) All over the state (b) Country (c) World (d) None of these	50 DZ
(a) Hub (b) Host (c) Gateway (d) Repeater  27. Internet is a network of which computer network?  (a) All over the state (b) Country (c) World (d) None of these  28. Many networks include a central computer that may be called?  (b) Servers (c) Client (d) Cetavayas	520 1
28. Many networks include a central computer that may be called?  (a) Bridges (b) Servers (c) Client (d) Gateways  29. Which of the following networks extends a private network across public network? ( )	
29. Which of the following networks extends a private network across public network? ( )  (a) LAN (b) EPN (c) SAN (d)VPN  30. Computer virus is?	1,20
30 Computer virus is 2 000 020 NO 620 000 020 020 020 020 020 020 020 020	15 020
(a) A hard was an con one our loss of the control o	10 10
(a) LAN (b) EPN (c) SAN (d)VPN  30. Computer virus is?  (a) A hard ware  (b) Windows tool  (c) A computer program (d) A system software	
(c) A computer program (d) A system software	121 B
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	over the of the special and the	g (79 JP	ro Abelo (f. 17 JOH)	ne of an extension
31. T	The conjugate complex of $\frac{1}{3+4i}$ is	in area no		
	The value of $(1 - \sin^2 A) \sec^2 A$ is			
	$f\overline{a} = 3i + 2j - 6k$ and $\overline{b} = 4i - 3j$			en $\bar{a}$ and $\bar{h}$ is
	Angstrom is a unit of		i the angle betwe	201 and 0 13
	OF 157 Section 11 Control of the con	100 100	ket is	en men dan san Astronom dan san
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37	Transverse wave consists of Vitamin is important in bl	ood clot	ting	pan_mah epp_pan_engo 180 08+
38.	is the primary function of	f a food	etabilizar?	500 000 000 TV 000 TV
0.00	Full form of INTERNET is	0 1000	staomzer:	0x0 442 500 0x0 0x1 0x2
	VPN stands for	- 100 F		20 0x0 020 020 020 000 000
si Tirki	<u>SECTION - C</u> (V			ons) 10x1=10
41. F	Find the median of the data 6, 12, 9, 10	. 16. 28.	25, 13, 15, 17	
42. I	Find $ 2i+3j+3k $	020 020	350 DZ 100 US 47	2 3 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
43. \	Find $ 2i + 3j + 3k $ What is the theory related to origin of the third involves the design construction.	universe'	)	2 D23 NO 122 D25 D25 NO 123 D2
44. W	What field involves the design, constru	cuon am	1 010819000000	1 ODORS :
45.W	What is the function of ATP in the cell?	) 020 Ban		240 020 07° 020 020 07°
46. V	What is the chemical name for table su	mar?	4.5	
47. V	What is a chemical change?	5) 0& P	ing the special properties	03/2 02/1 03/0 02/0 02/1 02/2 02/2 02/2 02/2 02/2 02
48. V	Which method is commonly used for p			
060	What is E- mail?	es 520 l	ge 93 393 393 Me 94	The part of the first that the first the
50. C	Give one application of joy stick	20 50	OND THE THE EAST TWO	. OH DIT TOU SEE AND DEE 470
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51	cis $\theta_1$ cis $\theta_2$	921 (1)	a. $cos\theta + i sint$	9
52.	cist	( )	$\mathbf{p} = cos\theta - i sin\theta$	
53.	$cis(-\theta)$	( )	c. $cis(\theta_1 + \theta_2)$	the stands of the west of
54.	Very large scale Integration	( )	d. III generatio	the committee that the committee of
55.	Stored programme	( )	e. IV generatio	n
		(,)	f. II generation	

	II.
	56. Mercury ( ) a C <sub>6</sub> H <sub>6</sub>
	57. Thorium ( ) b. CH <sub>4</sub>
	58. Benzene ( ) c. Radio active metal
	59. Methane ( ) d. Liquid metal
	60. Acetylene ( ) e. C <sub>2</sub> H <sub>6</sub>
	( ) f. C <sub>2</sub> H <sub>2</sub>
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	$\underline{SECTION - E} \text{ (True Or False)} \qquad 10x1 = 10$
9 70 30	
	$61. \text{Tan } 3A = \frac{2TanA}{1 + \text{Tan2A}} \text{ is}$
	62. In a data the maximum value is 100 and minimum value is 10 then the range =90 ( )
	63. Infrared waves are used in night vision devices
100 400 6	64. Barium belong to III group of periodic table
UCH 020 N	65. Isotopes are atoms of the same element
527 757 5	
125 020 1	67 Bluetooth allows your device to connect with another device.
	67. Bluetooth allows your device to connect with another device  68. A firewall is a type of hardware  (2)
	69. Radio waves are lowest frequency waves in electromagnetic spectrum
20 TO 34	70. $E = mc^2$ is Newtonian principle
9 92 32	20 Apr 120 Apr
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