COMMON PRE-BOARD EXAMINATION 2022-23

Subject: BIOLOGY-044 MARKING SCHEME

Date:

CLASS-XII

Maximum Marks: 70
Time: 3 hours

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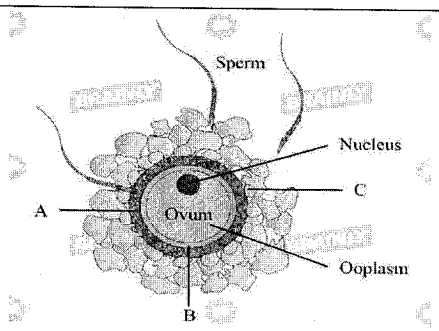
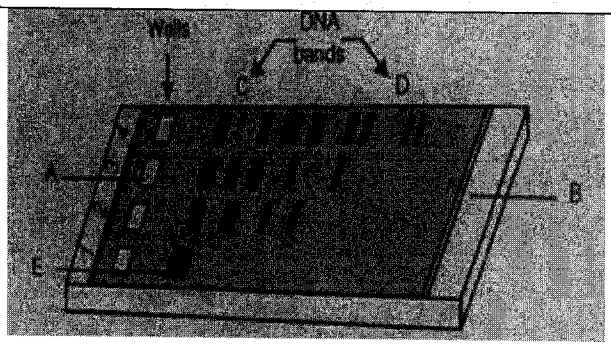
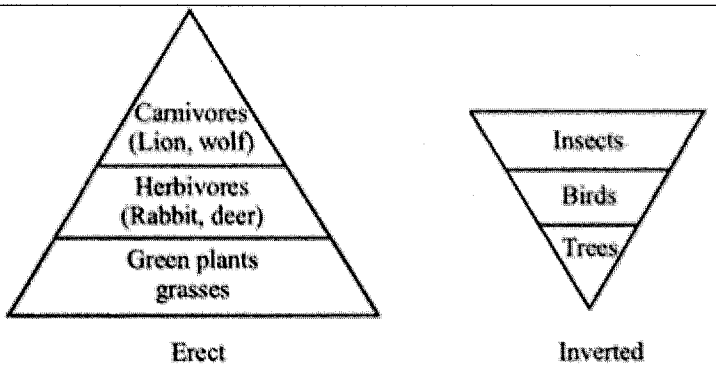
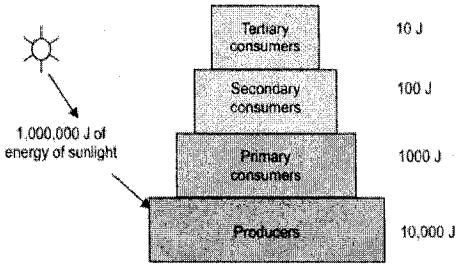
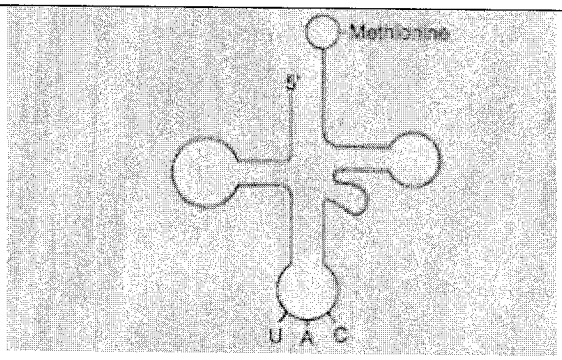
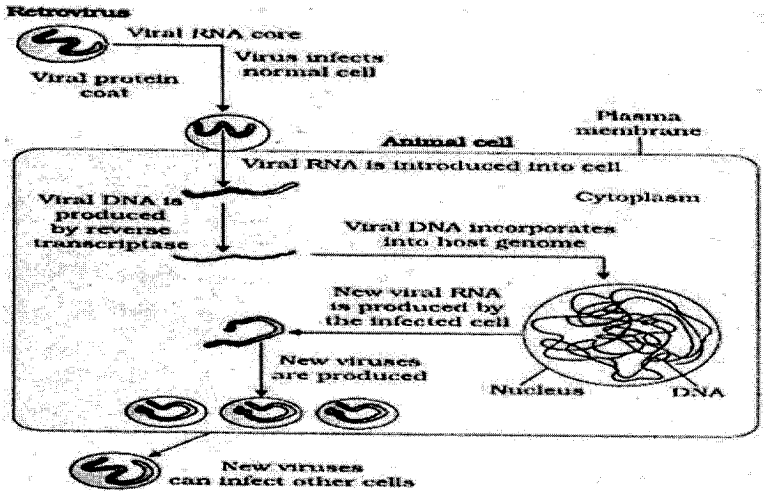
SECTION A

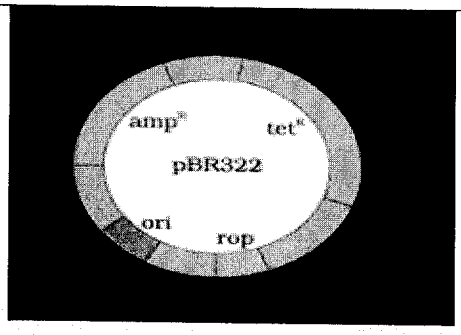
1	a) Cannot produce eggs	1
2	a) A-3,B-2,C-1	1
3.	d) Sex linked recessive	1
4.	d) i) and iv)	1
5	Which of the following are the reasons for rheumatoid arthritis? b) ii) and iv	1
6	a) Physiological barrier	1
7.	d) Oxygen consumption.	1
8	a) B-Denaturation at a temperature of about 98 degree Celsius separating the 2 DNA strands.	1
9	b) The size of the population remains constant.	1
10.	c) Ammensalism	1
11.	c) Standing crop	1
12.	d. Seed bank	1

Question No. 13 to 16 consist of two statements – Assertion (A) and Reason (R).
Answer these questions selecting the appropriate option given below:
A. Both A and R are true and R is the correct explanation of A.
B. Both A and R are true and R is not the correct explanation of A.
C. A is true but R is false.
D. A is False but R is true.

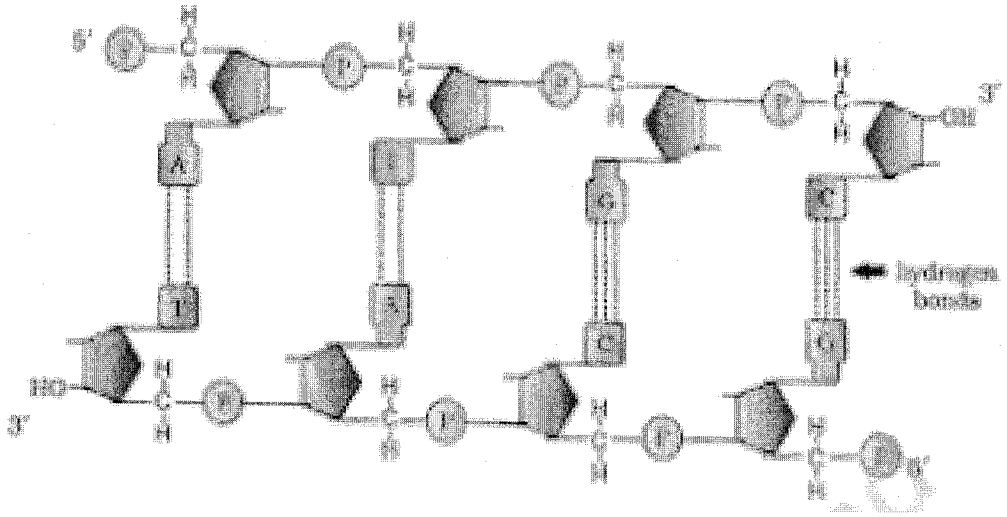
13.	**B. Both A and R are true and R is not the correct explanation of A.**	1
14	**C. A is true but R is false.**	1
15	**A. Both A and R are true and R is the correct explanation of A.**	1
16	**B. Both A and R are true and R is not the correct explanation of A.**	1
	SECTION B	
17.	 ½ + ½ a) A is Zona pellucida and C is Corona radiata.	2
	b) A forms fertilization membrane immediately after sperm penetration to prevent polyspermy . ½ + ½	
18.	YY /yy –cross -1 Phenotypic and genotypic ratio---- ½ + ½	2
19	a) Elephantiasis /Filariasis 1 b) Wuchereria bancrofti or W.malayi /vector is female mosquito. 1	2
20	 a) The smaller fragments move through the gel faster than the larger ones. 1 **b)** B is the anode end 1.	2

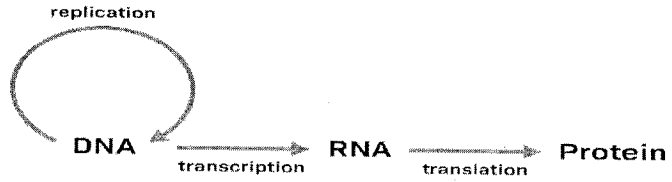
21	 **Fig: Pyramid of numbers** 1+1 **OR**  **(1)** Pyramid of energy is always erect since the amount of energy available at each tropic level decreases as we towards the apex. As a result maximum energy is available at lower tropic levels making the pyramid erect. (1)	2
	SECTION C	
22	**Give reason for the following.** a) For maintaining the chromosome number and to concentrate maximum nutrient in the form of cytoplasm b) Its because the oocyte released during ovulation is still immature and completes its meiotic division forming an ovum only on encountering the sperm . this happens in the fallopian tube. **c)** Placenta acts as an endocrine tissue.—as it produces HCG, HPL, Oestrogens and Progestogen hormones. 1+1+1	3
23	State the agent(s) which helps in pollinating in the following plants. Explain the adaptations in these plants to ensure pollination: a) Water lily- Insect/Wind-flowers on the surface of water b) Vallisneria –Water- female flowers on the surface and male flowers are released to the surface./carried passively/ reach female flowers	3

	c) Sea grasses –water – pollen ribbon like / carried by water/ reach the female flowers under water . 1+1+1	
24	 a) Adapter molecule- initiator Trna / anticodon 1 b) AUG 1 c) This binding brings about initiation of the translation process. 1	**3**
25	a) The process of evolution of different species in a given geographical area from a point and radiating to other areas of geography. 1 b) Explanation with examples. 2	**3**
26	• Antibody molecule has 2 small peptide chains called light chains and 2 longer heavy chains which is H_2L_2 . 1 • Acquired immunity—Explanation about humoral immune response and cell mediated immune response. 2 **OR** a) .Macrophages /Reverse transcriptase 1  b) 2	**3**

27	 a) They are selectable markers and are used to differentiate transformants from non transformants and recombinants from non recombinants. 1 b) Ori is the origin of replication and any alien DNA has to be linked to ori to be replicated. It also controls the copy number. 1+1	3
28	a) The sixth extinction is 100-1000 times much faster than what happened in the prehistoric time and if the same trend continues then more than 50% of the present species will go into extinction. 1 ½ b) Ex-situ---Explanation on zoo/ botanical garden /Cryopreservation / sperm banks/egg banks 1 ½	3
	SECTION D	
	Q.no 29 and 30 are case based questions. Each question has subparts with internal choice in one subpart.	
29	**Read the passage given below and answer the questions that follow.** **Observe the diagram and answer the questions.** The double helix model of DNA (deoxyribonucleic acid) consists of two intertwined strands. These strands are made up of nucleotides, which themselves consist of three component parts: a sugar group, a phosphate group, and a base. The sugar and phosphate groups combined form the repeating 'backbone' of the DNA strands. There are four different bases that can potentially be attached to the sugar group: adenine, thymine, guanine and cytosine, given the designations A, T, G and C. The bases are what allows the two strands of DNA to hold together. Strong intermolecular forces called hydrogen bonds between the bases on adjacent strands are responsible for this; because of the structures of the different bases, adenine (A) always forms hydrogen bonds with thymine (T), whilst guanine (G)	4

always forms hydrogen bonds with cytosine (C). In human DNA, on average there are 150 million base pairs in a single molecule – so many more than shown here!





a) 1

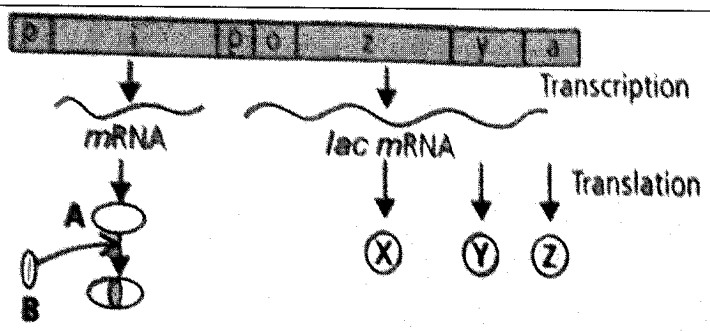
b) A purine comes opposite to a pyramidine.This generates approximately uniform distance between the two strands of the helix. 1

c) One atrand of DNA has a free phosphate moiety at the 5' end of ribose sugar while the other end has a free 3'OH which is called as 3' and 5'end respectively . and hence the two strands run anti parallel. 2

OR

c) Explanation about histone/octamer/importance of positive amino acids/nucleosome/chromatin 2

30.	**Addiction means habitual, psychological, physiological dependence on a substance (drugs/alcohol) or practice that is beyond the voluntary control of humans. Drug and alcohol abuse among youth and adolescents is starting to become another serious cause of concern all around the globe. The most commonly abused drugs are opioids, cannabinoids, and coca alkaloids.** **The addictive nature of alcohol and drugs and their perceived benefits, such as temporary relief from stress or pain, causes a person to try taking these in order to face peer pressure, examination-related and competition-related stresses. In doing so, they might get addicted.** a) Tendency to manifest a characteristic and unpleasant withdrawal syndrome if regular use of the addictive material is stopped. Symptoms- any 2signs ½ + ½ b) Opioids/It's a depressant while crack is a stimulant ½ + ½ c) Side effects in male /female –any 2 each--------- 1+1 **OR** c) helps to face problems/to accept failures as a part of life./helps to channelize energy inti healthy pursuits. 2	4
	SECTION E	
31	. union of gametes-ampullary isthumic junction/ followed by cleavage/-blastomeres/morula/blastocyst-trophoblast and inner cell mass /trophoblast attaches to endometrium-implantation 3 for -notes/ 2 marks for figures **OR** Formation of microspores / devt of tetrads /pollen /stages of development -3 Figure -2	5
32	a) If both transcribes- they will be complimentary and come together/ The same segment produces two different proteins and this will complicate the metabolic machinery. 2 b) Explanation about 3 different types of Trna / splicing / tailing and capping /-3 **OR**	5



a) Lac operon 1

b) A is repressor/ B is the inducer-lactose / inactivates the repressor so that it cannot bind to the operator causing it to switch on. 1+1+1

c) Beta galactosidase / permease/transacetylase-responsible for lactose metabolism 1

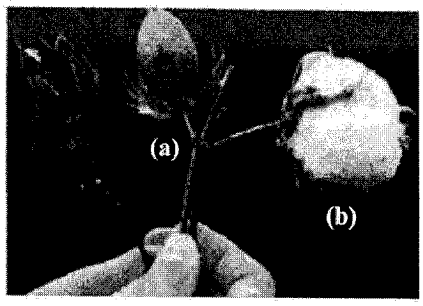
33

a) Plants cloned with toxic gene from bacterial cells so that its expressed in them to offer protection against insects without the need for insecticide. 1

b) Bt Cotton / B.thuringiensis produce proteins which kill insects/ cry protein becomes active in alkaline medium of gut of insects /binds to mid gut cells/ causes pores and lysis and death of insect. /This gene isolated and incorporated into many crops . 2

c) Name a genus of baculo virus. Why are they considered as good bio control agents? Nucleopolyhedro virus /useful for narrow species specific insecticidal application/no negative impacts on non target forms/useful in IPM programmes. 2

OR



a) a) destroyed by boll worms/ b is a fully mature cotton boll 1

b) cryIAb-corn / cry IAc and cryIIAb – for cotton 2

c) Genetically modified cotton with cry gene from Bacillus thuringiensis 1

5

	d) In bacteria it is in an inactive form but in insect gut gets converted into active form of toxin due to alkaline Ph which solubilize the crystals causing the deleterious effect. 1 ----------	