

MODEL QUESTION PAPER – 2012

ZOOLOGY

HSE – II

Time: 1hour

Max. Mark: 30

1. Given below are some of the contraceptive methods.

- a) Periodic abstinence
- b) Coitus interruptus
- c) Lactational amenorrhea
- d) I.U.D's

- i) Find out the odd one. (½)
- ii) What is common among others? (½)

2. Foetal sex can be determined by a test based on the chromosomal pattern from the amniotic fluid.

- a) Name the test. (1)
- b) The revealing of sex through this test is banned now. Is this ban necessary? Comment. (1)

3. The sequence of coding strand in a transcription unit is as follow: 5'- ATGCATGCATGCATG- 3'

Write down the sequence of -

a) Template strand (1)

b) RNA transcribed from the above DNA (1)

4. BOD of three water samples is given below:

i) Sample 1 – 50mg/L

ii) Sample 2 – 150mg/L

iii) Sample 3 – 400mg/L

a) Which water sample is least polluted? ($\frac{1}{2}$)

b) Define BOD. ($\frac{1}{2}$)

5. A girl of subnormal intelligence has partially open mouth and furrowed tongue.

a) Identify the genetic disorder. (1)

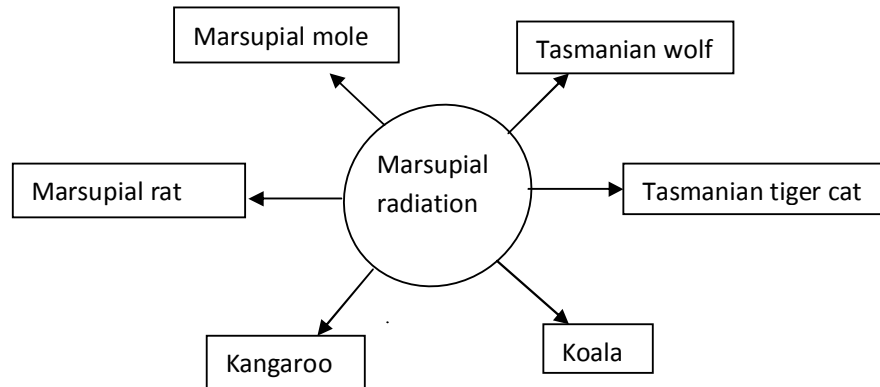
b) Mention the cause of this disorder. (1)

6. Disturbance in Hardy-Weinberg equilibrium results in evolution.

a) Define Hardy-Weinberg equilibrium. ($\frac{1}{2}$)

b) Write notes on any two factors affecting Hardy-Weinberg equilibrium. (1)

7. Study the diagram given below and answer the following questions.



a) Identify the evolutionary phenomenon. (½)

b) Differentiate analogous and homologous structures. How are they related to convergent and divergent evolution? (2)

8. In which part of the human reproductive system do the following events (a) and (b) occur?

a) Fertilization. (½)

b) Implantation. (½)

c) State the importance of colostrum. (1)

9. Surveys and statistics show that use of drugs and alcohol has been on the rise especially among the youth. This is really a cause of concern as it could result in many harmful effects. Suggest any four measures that would be useful for prevention and control of alcohol and drugs abuse among adolescents. (2)

10. Match column A with columns B & C.

	A	B	C
1.	Wuchereria	Bacteria	Common cold
2.	Salmonella typhi	Virus	Malaria
3.	Rhinoviruses	Protozoan	Typhoid
4.	Plasmodium	Helminthes	Filaria

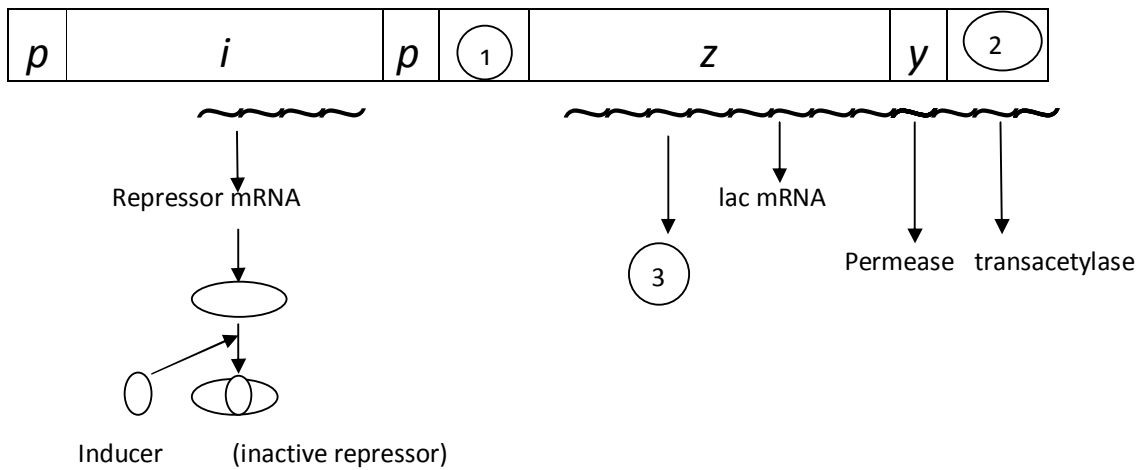
(2)

11. The percentage of Adenine in a double stranded DNA isolated from human liver is observed to be 32. What are the expected percentage of Thymine, Guanine and Cytosine? Justify. (2)

12. The year 2010 has been declared as the International Biodiversity Year by United Nations (UN).

- Point out the levels of diversity in nature. (1½)
- Give a brief description about “The Evil Quartet”. (1½)

13. The figure below represents the *lac* operon.



Based on the figure answer the following questions:

- The genes labelled as 1 & 2.
- The product of *z* gene labelled as 3.
- The substrate which acts as the inducer. (2)

14. The family pedigree of Queen Victoria shows a number of descendants affected by a particular genetic disorder.

a) Name the disorder. (½)

Select the correct word from the following pairs which describes this disorder

b) Recessive/dominant.

c) Mendelian disorder / chromosomal disorder.

d) Autosomal / sex linked. (1½)

15. You must have noticed that bottled fruit juices bought from the market are clearer as compared to those made at home. Give reason. (1)

16. Ovulation is the process of release of ovum by the rupture of Graafian follicle.

a) Name the hormone involved in ovulation.

b) Mention the structure formed by the remaining part of the Graafian follicle. (1)

17. Morgan hybridized yellow-bodied, white-eyed females to brown-bodied, red-eyed males and intercrossed their F₁ progeny. He observed that the two genes did not segregate independently of each other and the F₂ ratio deviated very significantly from the 9:3:3:1 ratio. Comment. (1)

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SCORING KEY

Question No:	Points	Marks	Total
1	i) IUD'S ii) Natural contraceptive methods	$\frac{1}{2}$ $\frac{1}{2}$	1
2	a. Amniocentesis, b. It is necessary to avoid female foeticide and sexual imbalance.	1 1	2

3	a. 3' TACGTACGTACGTAC 5' b. 5' AUGCAUGCAUGCAUG 3'	1 1	2
4	a. Sample -1 b. Definition	½ ½	1
5	a. Down's syndrome b. Trisomy of 21 st chromosome	1 1	2
6	a. Definition b. Gene migration, genetic drift, mutation, genetic recombination, natural selection. (Any two)	½ 1	1 ½
7	a. Adaptive radiation b. Analogous structures perform similar functions but are not anatomically similar. Homologous structures are anatomically similar but perform different functions. Homology is based on divergent evolution whereas analogy is based on convergent evolution.	½ 1 1	2 ½
8	a) Ampullary isthmic junction of fallopian tube. b) Endometrium of uterus c) Colostrum contains several antibodies essential to develop resistance for the new born babies.	½ ½ 1	2
9	i) Avoid undue peer pressure. ii) Education and counseling. iii) Seeking help from parents and peers. iv) Looking for danger signs. v) Seeking professional and medical help. (Any four)	½ ½ ½ ½	2
10	1. Wuchereria – Helminthes – Filaria 2. Salmonella typhi – Bacteria -- Typhoid 3. Rhinoviruses – Virus – Common cold	½ ½ ½	2

	4. Plasmodium – Protozoan --Malaria	½	
11	Adenine =32%, Thymine = 32%, Cytosine = 18%, Guanine = 18% Chargaff's rule states that in a double stranded DNA the ratios between Adenine & Thymine and Guanine & Cytosine are constant and equals one.	½ ½ ½ ½	2
12	a) Genetic diversity, species diversity, ecological diversity. b) Evil Quartet – Sorbiquet used to describe causes of biodiversity loss. i) Habitat loss and fragmentation. ii) Over-exploitation. iii) Alien species invasion. iv) Co-extinctions. (any three)	1 ½ 1 ½	3
13	a) 1 – Operator gene, 2 – σ gene. b) 3 – β -galactosidase. c) Lactose	1 ½ ½	2
14	a) Haemophilia b) recessive c) Mendelian disorder d) Sex-linked	½ ½ ½ ½	2
15	Clarified by the use of pectinases and proteases	1	1
16	a) Luteal Hormone b) Corpus luteum	½ ½	1
17	Linkage Linked genes – Genes located on the same chromosome	½ ½	1
