

2009

ZOOLOGY

PAPER—Z - 203

*Full Marks : 40*

*Time : 2 hours*

*The figures in the right-hand margin indicate marks*

*Candidates are required to give their answers in their own words as far as practicable*

GROUP—A

*(Molecular Biology)*

1. Answer *two* questions from the following : 2 × 2

(a) What is primosome ? What is its function ?

(b) With regard to DNA replication, define the term bidirectionality.

*(Turn Over)*

(c) Describe the sequence in bacterial mRNA that promotes recognition by 30 s.

(d) Why lac repressor is considered as an allosteric protein ?

2. Answer any *two* from the following : 4 x 2

(a) Draw a picture that describes how helicase works ?

(b) For each of the following transcription factors, how would eukaryotic transcriptional initiation be affected if it were missing ?

A. TF II B

B. TF II D

C. TF II H.

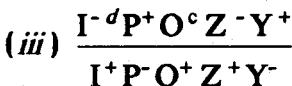
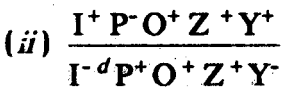
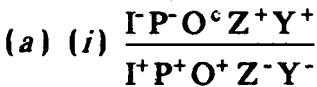
(c) Explain the functional roles of the *A*, *P* and *E* sites during translation.

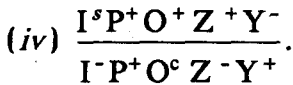
(d) Do the following events during bacterial translation occur primarily within the 30s, within the 50s or at the interface between these two ribosomal subunits?

- A. mRNA - tRNA recognition.
- B. Peptidyl - transferase reaction
- C. Exit of the polypeptide chain from the ribosome
- D. Binding of initiation factors IF 1, IF 2 and IF 3.

3. Answer any *one* of the following :

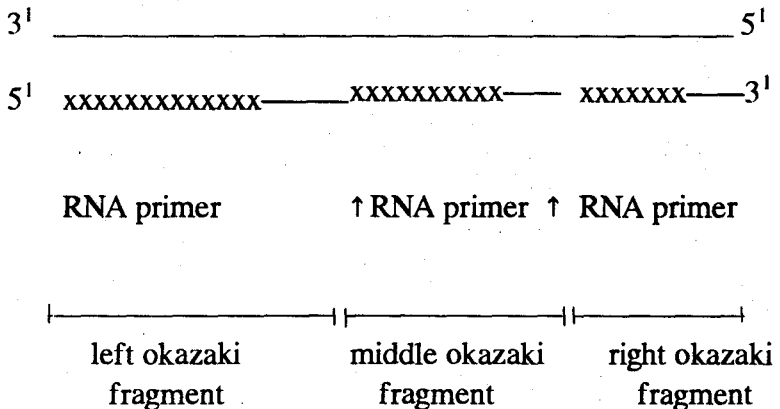
8 x 1





What type of expression of  $\beta$ -galactosidase and permease you would expect in presence/absence of inducer. Explain your view with diagram.

- (b) In the following drawing, the top strand is the template DNA and the bottom strand shows the lagging strand prior to the action of DNA polymerase I. The lagging strand contains three okazaki fragments. The RNA primers have not yet been removed.



- (i) Which okazaki fragment was made first? Why?
- (ii) Which primer would be the first one to be removed by DNA pol I, the left primer or the right primer? For this primer to be removed by DNA pol I and for the gap to be filled in, is it necessary for the okazaki fragment in the middle to have already been synthesized? Explain why?
- (iii) After DNA pol I removes the middle RNA primer and fills in the gap with DNA, where does DNA ligase function? See the arrows on either sides of the RNA primer. Is ligase needed at the left arrow, at the right arrow, or both?

GROUP—B

(Parasitology)

4. Answer any *two* questions from the following : 2 × 2

- (a) Define zoonosis and paratenic host with example.

(b) (i) What is axostyle ?

(ii) What is Glycocalyx ?

(c) What are Pf EMP 1 and Pf HRP 2 ?

(d) What is meant by ABR and ATP ?

5. Answer any *two* questions from the following : 4 x 2

(a) Sex reversal in host is a result of physiological interaction between host and Parasite.-- Discuss. 4

(b) What is the distinctive feature of *Schistosoma* sp. Discuss briefly about the *first* larval stage of this Parasite with suitable diagram.  $\left(\frac{1}{2} + 3\frac{1}{2}\right)$

(c) (i) What is Schistosomule ?

(ii) Write the bionomics of sand fly. 1 + 3

(d) Enumerate the structure of nematode tegument. 4

6. Answer any *one* question from the following :  $8 \times 1$

(a) Discuss briefly about the life-cycle of *Balantidium coli*. Mention its Pathogenesis and Prophylaxis.  $5 + 2 + 1$

(b) (i) Mention the immunological and para-immunological effector cells, molecules and mechanisms involved in host protection against Parasite.

(ii) Discuss the host factor in epidemiology of filariasis.  $4 + 4$