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PG/IIIS/H.PHY-304/13

M.Sc. 3rd Semester Examination, 2013

HUMAN PHYSIOLOGY

PAPER — PHY- 304

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*

Illustrate the answers wherever necessary

(Microbiology and Immunology)

UNIT —31

Answer any **two** questions

1. (a) What do you understand by normal microbial flora of human host ?
- (b) Why it is difficult for microbes to colonize in lower respiratory tract ?

(Turn Over)

(2)

(c) What is germ-free animal? What is its significance? Why Coagulase enzyme of staphylococcus aureus is considered as virulence factor? $2 + 2 + (2 + 2) + 2$

2. (a) What is C4 cycle? Why it is so named? What is its importance?

(b) Write down the reaction sequence of C-3 cycle that give rise to recycling of RuBP. $(2 + 1 + 2) + 5$

3. (a) Give an account of the processes those participate in cycling of nitrogen through biosphere.

(b) What is biological nitrogen fixation? Why it is important?

(c) Write a brief note on enzyme nitrogenase and its mode of action. $2 + 2 + 1 + 5$

4. (a) What do you understand by bioremediation?

(3)

- (b) What are the basic mechanisms involved in biodegradation of Xenobiotics ?
- (c) Describe briefly the biodegradation mechanism of nitroaromatic compounds. $3 + 3 + 4$

UNIT –32

Answer any **two** questions

1. (a) What is class switching ?
- (b) Schematically describe the process of V(D)J recombination. What is the significance of antibody diversity ? $4 + (5 + 1)$
2. (a) Write down the endocytic pathway with suitable diagram. What is the importance of antigen-presentation ?
- (b) Describe the effector functions of TH1 and TH2 cells. $(4 + 2) + 4$
3. (a) What do you mean by plasticity of T-cells ?

(4)

(b) What is signalosome complex?

(c) Discuss the mechanism of T-cell activation.

2 + 2 + 6

4. (a) What do you mean by PAMP or DAMP?

(b) Describe the receptors involved in innate immunity. Briefly discuss their role in this type of immunity.

2 + (3 + 5)

(*Ergonomics and sports physiology*)

UNIT –31

Answer any **two** questions

1. (a) Discuss the effects of exercise on hypothalamus-pituitary- adrenal axis.

(b) State the effects of exercise on catecholamines.

(c) State the role of beta-endorphin during exercise.

4 + 3 + 3

2. (a) Discuss the importance of carbohydrate supplementation in (i) pre-exercise (ii) exercise and (iii) recovery periods.
- (b) Discuss the role of vitamin B₁ and calcium in exercise. 6 + 4
3. (a) State the principle of measuring VO₂-max by direct method.
- (b) Make a comparison between direct and indirect method for determination VO₂-max.
- (c) Describe an indirect method for determination of VO₂-max. 3 + 3 + 4
4. (a) State different types of muscle fibers present in our body. Mention their involvement in different types of sports activities.
- (b) How weak binding state and strong binding states are developed during muscle contraction? (2 + 4) + 4

(6)

UNIT -32

Answer any **two** questions :

1. What is Somatotyping ? Discuss the characteristics of an ideal endomorphic and a mesomorphic body. How ectomorphic component can be determined ? 2 + 6 + 2

2. (a) What is AMI ? Discuss the causes of AMI with evidences.
(b) State the effects of heavy exercise on labour and delivery.
(c) Is athletic participation during childhood delays onset of menarche ? 5 + 3 + 2

3. (a) Make a comparison between yoga and general physical exercise from the physiological point of view.
(b) State the effects of practice of Yoga on the balance of body.
(c) Discuss different types of sport equipments for preventing sports injury. 3 + 3 + 4

4. (a) What is doping ?
(b) "Cocaine adiction can kill us"-Explain.
(c) Mention the adverse effects of using anabolic steroids in sports. $2 + 4 + 4$

Special Paper —(*Endocrinology, Reproductive Physiology and Family Welfare*)

UNIT –31

Answer any two questions

1. (a) State the steps in expression of a protein hormone encoding gene.
(b) What do you know about "One gene, two hormones" in case of rat calcitonin gene ? $4 + 6$
2. (a) Write the principle of Radioimmunoassay (RIA).
(b) Describe the requirement and assay protocol of RIA.
(c) Mention the advantages and applications of RIA. $2 + (2 + 3) + \left(1\frac{1}{2} + 1\frac{1}{2}\right)$

(8)

3. (a) Mention the types, subtypes and ligands of G-protein coupled receptors (GPCR).
(b) Elaborate the mode of action of GPCR involving PKA. (2 + 2) + 6
4. (a) State the zonal classification and functions of prostate gland.
(b) Write on the mitotic and meiotic germ cell cycle control.
(c) How does triggering of germ cell apoptosis occur? (2 + 2) + 3 + 3

UNIT -32

Answer any two questions

1. (a) Elaborate the developmental process of germ cells in Ovary.
(b) What is folliculogenesis?
(c) Mention the role of progesterone in the follicle fluid. 6 + 2 + 2

2. (a) Write the properties of Lectin receptor.
- (b) Describe the synchronous modulation of lectin and lectin receptor during epididymal sperm maturation.
- (c) What do you know about motility initiating protein of epididymal plasma ? 3 + 4 + 3
3. (a) Describe the Δ^4 - and Δ^5 -pathways of steroidogenesis.
- (b) State the relationship between estrogen and inflammatory mediators. 5 + 5
4. (a) What is infertility ?
- (b) What are the advantages and disadvantages of ovarian stimulation with intrauterine insemination ?
- (c) Mention any two stimulation protocols for COH combined with |U|. 2 + 4 + 4
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