

2015

**BIOCHEMISTRY****Paper – BCT – 301****(Nutritional Biochemistry)****Full Marks – 25***The figures in the margin indicate full marks**Candidates are required to give their answers in their own words as far as practicable*

1. (a) Resveratrol has been reported as a potential preventive for prostate cancer. Give two experimental evidences for this claim. 4½
- (b) A colon cancer cell line (HCT16) was taken and the cells were transfected with anti-miR-107 or anti-miR-21 or a control anti-miR. What would be the change in protein expression ? How would you determine this ? 4
- (c) miR-221 is
- (i) up regulated in obesity and
- (ii) controlled by leptin.
- How could you prove these facts ? 4
- OR**
2. (a) How do levels of ATF4 vary under normal and starvation in mammalian systems ? Describe the mechanism for the changes. 6
- (b) In an experiment with doubly-labeled water plot the decay of  $O^{18}$  and  $H^2$ . How can you obtain the moles of  $CO_2$  and the energy produced using the above decay plots ? 2+4½
3. (a) How is glucose transported across the cell membrane ? 4
- (b) Why is  $Na^+$  cotransported during glucose infusion ? 2
- (c) How is amino acid transported across the biological membrane ? 6½
- OR**
4. (a) What is adaptive thermogenesis ? 2
- (b) Describe the mechanism of proposed heat loss occurring during adaptive thermogenesis. 3
- (c) "Act defect in adaptive thermogenesis induced by diet may promote severe weight gain." Justify the statement. 3
- (d) Name one fat soluble vitamin involved in the blood clotting process. How does the vitamin play its role in the clotting process ? 1+3½
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