

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU
ARE ASKED TO DO SO)

M.Phil./Ph.D./URS-EE-Oct.-2017

SUBJECT : Environmental Science

A

10029

Sr. No.

Time : 1¼ Hours

Max. Marks : 100

Total Questions : 100

Roll No. (in figures) _____ (in words) _____

Name _____ Father's Name _____

Mother's Name _____ Date of Examination _____

(Signature of the Candidate)

(Signature of the Invigilator)

**CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE
STARTING THE QUESTION PAPER.**

1. *All questions are compulsory.*
2. The candidates **must return** the question booklet as well as OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means/misbehaviour will be registered against him/her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.
3. In case there is any discrepancy in any question(s) in the Question Booklet, the same may be brought to the notice of the Controller of Examinations in writing **within two hours** after the test is over. No such complaint(s) will be entertained thereafter.
4. The candidate **must not** do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question booklet itself. Answers **must not** be ticked in the question booklet.
5. **There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.**
6. Use only **Black or Blue Ball Point Pen** of good quality in the OMR Answer-Sheet.
7. *Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Complaints, if any, regarding misprinting etc. will not be entertained 30 minutes after starting of the examination.*

M.Phil./Ph.D./URS-EE-Oct.-2017/(Env. Sci.)/(A)

1. The type of succession that occurs after a volcanic eruption is :
(1) Primary (2) Secondary
(3) Tertiary (4) Autogenic
2. The phenomenon known as character displacement is associated with :
(1) Allopatric species (2) Sympatric species
(3) Competitive species (4) Primary succession
3. A species that interacts with many other organisms in its community in critical ways can be called :
(1) Endemic species (2) Pioneer species
(3) Keystone species (4) Predator
4. Which of the following is an organic gas ?
(1) Hydrocarbons (2) Aldehydes
(3) Ketones (4) Ammonia
5. The major contributor of Carbon monoxide is ?
(1) Motor vehicle (2) Industrial process
(3) Stationary fuel combustion (4) None of the above
6. The threshold limit of benzene in air is ?
(1) 15 ppm (2) 20 ppm
(3) 25 ppm (4) 30 ppm
7. Amrita Devi Bishnoi sacrificed her life to the protection of :
(1) Sal trees (2) Khejri trees
(3) Alpine meadows (4) Pine trees
8. Kattas is the ancient method of water harvesting found in :
(1) Himachal Pradesh (2) Tamil Nadu
(3) Karnataka (4) Madhya Pradesh
9. The percentage of evaporation of water from land and ocean surface are respectively ?
(1) 16 and 84% (2) 84 and 16%
(3) 65 and 35% (4) 60 and 40%
10. The restricted distribution of species in small area called :
(1) Biome (2) Niche
(3) Endemism (4) Ecosphere

11. Which of the following species is endemic ?
 (1) Vanda (2) Drosera sp
 (3) Gnetum ula (4) Ginkgo biloba
12. Which one is *not* endangered ?
 (1) Bald Eagle (2) Giant Panda
 (3) Podophyllum (4) Mergosa
13. Temporary hardness is caused due to ?
 (1) Magnesium carbonate (2) Magnesium sulphate
 (3) Calcium sulphate (4) Calcium chloride
14. Which of the following radioactive element is largely associated with bone cancer ?
 (1) Radium-226 (2) Iodine
 (3) Thorium-232 (4) Strontium-90
15. Where did the Exxon Valdex oil spill take place ?
 (1) The gulf of Mexico (2) Off the cost of Alaska
 (3) Near China (4) Off the cost of New York
16. The weight of water vapour per unit weight of air is ?
 (1) Specific Humidity (2) Relative Humidity
 (3) Absolute Humidity (4) None of the above
17. Layer which protects earth from being hit by meteoroids is ?
 (1) Troposphere (2) Mesosphere
 (3) Thermosphere (4) Stratosphere
18. Match the following :
- | | |
|-------------|----------------|
| (a) Cirrus | (A) Feather |
| (b) Cumulus | (B) Heap |
| (c) Stratus | (C) Layer type |
| (d) Nimbus | (D) Rain cloud |
- | | | | | |
|-----|-----|-----|-----|-----|
| | (a) | (b) | (c) | (d) |
| (1) | (A) | (B) | (C) | (D) |
| (2) | (A) | (C) | (B) | (D) |
| (3) | (C) | (A) | (D) | (C) |
| (4) | (D) | (C) | (B) | (A) |

19. The Ekman Spiral describes :
- (1) Speed and flow of surface waters at various depths
 - (2) Strong winds that result in tornadoes
 - (3) The wind-flow pattern in a jet stream
 - (4) All of the above
20. Species that occur in different geographical regions separated by special barriers are :
- (1) Sibling
 - (2) Sympatric
 - (3) Allopatric
 - (4) None of the above
21. Which of the following is a Biodiversity Hot-spot in India ?
- (1) Western Himalaya
 - (2) Eastern Ghats
 - (3) Leh
 - (4) Sundalands
22. In the areas of intensive cultivation with excessive use of irrigation, especially in areas of green revolution, the fertile alluvial soils are becoming saline. What should be added in the soil to solve the problem of salinity ?
- (1) Zinc
 - (2) Phosphorus
 - (3) Gypsum
 - (4) Nitrogen
23. Calculate the change in the chemical potential of a perfect gas when it expands isothermally at a temperature of 20.0°C so that its volume doubles.
- (1) -1.69 kJ mol^{-1}
 - (2) -115 J mol^{-1}
 - (3) $+1.69\text{ kJ mol}^{-1}$
 - (4) $+115\text{ J mol}^{-1}$
24. Calculate the entropy change when 2.0 mol of a perfect gas A and 3.0 mol of a perfect gas B mix spontaneously :
- (1) $+195\text{ J K}^{-1}$
 - (2) $+28\text{ J K}^{-1}$
 - (3) -12 J K^{-1}
 - (4) -8.34 kJ K^{-1}
25. pH of a saturated solution of $\text{Ba}(\text{OH})_2$ is 12. The value of solubility product (K_{sp}) of $\text{Ba}(\text{OH})_2$ is :
- (1) 4.0×10^{-6}
 - (2) 5.0×10^{-6}
 - (3) 4.0×10^{-7}
 - (4) 5.0×10^{-7}
26. Which of the following produces the electron beam in magnetic deflection mass spectrometer ?
- (1) Tungsten filament
 - (2) Quartz rod
 - (3) Silica
 - (4) Rhodium filament

27. In which of the following ways, absorption is related to transmittance ?
- (1) Absorption is the logarithm of transmittance
 - (2) Absorption is the reciprocal of transmittance
 - (3) Absorption is the negative logarithm of transmittance
 - (4) Absorption is a multiple of transmittance
28. Which of the following cannot be used as adsorbent in Column adsorption chromatography ?
- (1) Magnesium oxide
 - (2) Silica gel
 - (3) Activated alumina
 - (4) Potassium permanganate
29. Which of the following compounds is *not* an organic substance ?
- (1) Nicotine
 - (2) Rotenone
 - (3) Pyrethrum
 - (4) Lindane
30. What are the units of LD50 ?
- (1) Gram/gram of animal body weight
 - (2) Kilogram/gram of animal body weight
 - (3) Milligram/gram of animal body weight
 - (4) Milligram/kilogram of animal body weight
31. When is the World Wild Life week ?
- (1) First week of September
 - (2) Last week of September
 - (3) First week of October
 - (4) Last week of October
32. Which of the following pairs of an animal and plant represents endangered organisms in India ?
- (1) Black duck and Banyan
 - (2) Rhesus monkey and Tamarind
 - (3) Leopard and Cinchona
 - (4) Red Panda and *Bentinckia nicobarica*
33. Nilgiri Tahr, an endangered species is the state animal of which of the following states ?
- (1) Karnataka
 - (2) Tamil Nadu
 - (3) Andhra Pradesh
 - (4) Kerala
34. Butanol is obtained by fermenting molasses by ?
- (1) *Clostridium butyricum* and *Clostridium acetobutylicum*
 - (2) *Clostridium butyricum* and *Clostridium tetanai*
 - (3) *Clostridium butyricum* and *Lactobacillus*
 - (4) *Clostridium butyricum* and *Clostridium oceanicum*

35. First experiment regarding evolution of Life was performed by ?
(1) Watson and Crick (2) Oparin and Haldane
(3) Urey and Miller (4) Meselson and Stahl
36. Which of the following zones in a lake suffers from a lack of light and therefore limited photosynthesis is able to take place ?
(1) Pelagic (2) Littoral
(3) Profundal (4) Euphotic
37. Which of the following National Park is in Odisha ?
(1) Namdapha National Park (2) Tadoba National Park
(3) Jaldapara National Park (4) Simlipal National Park
38. Obsidian is rich in :
(1) Silica (2) Iron
(3) Cobalt (4) Calcium
39. The intensity scale earthquake is called ?
(1) Mercalli scale (2) Richter scale
(3) Number scale (4) None of these
40. El-Nino happens because ?
(1) Trade winds strengthens which brings up warm ocean water
(2) Trade winds weaken which doesn't brings up the cold water
(3) Trade winds make the water cold
(4) Trade winds strengthens which doesn't brings up the cold water
41. At the equator there is low pressure belt called the
(1) Horse latitude (2) Jet streams
(3) Polar easterlies (4) Doldrums
42. Which plateau is known as the mineral heart land of India ?
(1) Bhandar Plateau (2) Chhota Nagpur Plateau
(3) Deccan Plateau (4) Tibetan Plateau
43. Which is the leading state in Lead & Zinc reserves ?
(1) Karnataka (2) Maharashtra
(3) Rajasthan (4) West Bengal

44. The following statically test is used to ascertain whether there is significant difference between the variances of two sets of observation :
- (1) t-test (2) F-test
(3) Chi square test (4) Regression
45. The geometric mean of the following data is :
4, 10, 25, 10
- (1) 10 (2) 5
(3) 12.25 (4) 100/49
46. If the mean and variance of a Poisson distribution are μ and σ , then the following relation is correct :
- (1) $\sigma = \mu^2$ (2) $\sigma^2 = \mu$
(3) $\sigma = 2\mu$ (4) $\sigma = \sqrt{\mu}$
47. In the Gaussian Plume Model, the plume rise varies with Buoyancy Flux Parameter F as :
- (1) F (2) $F^{1/2}$
(3) $F^{1/3}$ (4) $F^{1/4}$
48. Molar extinction coefficient of H_2O_2 at 240 nm is $0.04 M^{-1} cm^{-1}$. The concentration of H_2O_2 in a solution which has absorbance of 0.6 in a 3 cm cuvette will be :
- (1) 5 M (2) 10 M
(3) 15 M (4) 20 M
49. If D = Detector Dimension, F = Focal Length, H = Flying Height, then Ground Resolution Element (GRE) is equal to :
- (1) $(D/F) \times H$ (2) D/F
(3) H/F (4) D/H
50. Assume that the atmosphere is isothermal at $25^\circ C$ and the estimated maximum daily surface temperature is $35^\circ C$, the mixing height is (take adiabatic lapse rate to be $1^\circ C$ per 100 m).
- (1) 3.5 km (2) 2.5 km
(3) 1.5 km (4) 1 km
51. Natural ore of radioactive materials does not contain which one of the following isotope ?
- (1) U^{235} (2) Pu^{239}
(3) U^{238} (4) Th^{232}

52. Which one of the following is used to determine ambient concentration of suspended particulate matter ?
- (1) Cascade impactor (2) Kjeldahl's Flask
(3) Sacchi Disk (4) Folin-Wu method
53. The power from the sun intercepted by the earth is approximately :
- (1) 1.8×10^8 MW (2) 1.8×10^{11} MW
(3) 1.8×10^{14} MW (4) 1.8×10^{17} MW
54. Global radiation =
- (1) Direct radiation – Diffuse Radiation
(2) Direct radiation + Diffuse Radiation
(3) Direct radiation / Diffuse Radiation
(4) Diffuse Radiation / Direct radiation
55. Direct conversion of heat energy into electrical energy is possible through :
- (1) MHD generators (2) Fuel or solar cells
(3) Thermionic converters (4) Both (1) and (3)
56. What is pulverized coal ?
- (1) Non smoking coal (2) Coal free from ash
(3) Coal broken into fine particles (4) Coal which burns for long time
57. Thermal gradient in a geo thermal plant is given by :
- (1) Heat flux \times Thermal conductivity
(2) Heat flux / Thermal conductivity
(3) Thermal conductivity / Heat flux
(4) None of these
58. Earth Hour organized by WWF in which year ?
- (1) 1990 (2) 1997
(3) 2007 (4) 2005
59. To meet Euro-II emission standards, what should be the sulphur content in the ultra low sulphur diesel ?
- (1) 0.05% or less than this (2) 0.10%
(3) 0.15% (4) 0.20%

60. L_{10} (18 hrs) index is used to measure ?
 (1) Air pollution (2) Health of a person
 (3) Road traffic noise (4) None of above
61. Zeolites are hydrous silicate minerals which are used to :
 (1) Remove toxic chemicals from water
 (2) Neutralize water acidity
 (3) Destroy disease causing organisms in municipal water supply
 (4) Soften water
62. Point out the right match concerning the toxic metal and associated adverse impact :
 (1) Zn - Brain tissue damage (2) Ni - Keratosis
 (3) Ar - Renal poisoning (4) Hg - Pulmonary disease
63. The chemical formula for CFC-11 is :
 (1) CF_2Cl_2 (2) $CFCl_3$ (3) $CHFCl_2$ (4) $CHCl_3$
64. The false statement regarding the environmental impact assessment is :
 (1) Schedule I -> Lists of projects (2) Schedule II -> Application forms
 (3) Schedule III -> Details of EAC (4) All of the above
65. The important step/s in the predication of impacts is/are :
 (1) Carrying out the evaluation of impacts
 (2) Study of EIA
 (3) Preparation of environmental management plan
 (4) All of the above
66. All the cases of diversion of forests land should be approved by :
 (1) Central Government (2) Conservator of Forests
 (3) State Land Use Board (4) Ministry of Environment and Forests
67. The projects of which of the following are being assessed for Environmental Impact ?
 (1) Irrigation and Power (2) Administration
 (3) Public investment (4) All of these
68. If slate is exposed to more heat and pressure it changes into :
 (1) Phyllite (2) Schist
 (3) Gneiss (4) Garnet

69. Basel convention is related to the :
- (1) Trans-boundary movement of hazardous waste and their disposal
 - (2) Ozone layer depletion
 - (3) Sustainable development
 - (4) Earth summit
70. Which of the following is *not* a significant cause of urban sprawl ?
- (1) Agricultural farmland is lost
 - (2) Population increases in the city
 - (3) Rail transport and the automobile
 - (4) High land prices in the city
71. Yu-cheng Disease in Taiwan is due to the toxic effect of :
- (1) Lead
 - (2) PCBs
 - (3) Dioxin
 - (4) Asbestos
72. National institute of disaster management is at ?
- (1) Bangalore
 - (2) Hyderabad
 - (3) Mumbai
 - (4) New Delhi
73. India's national tsunami warning system became operational in ?
- (1) 2005
 - (2) 2006
 - (3) 2007
 - (4) 2008
74. Which one of the following is the most destructive ?
- (1) Cyclone
 - (2) Tornado
 - (3) Typhoon
 - (4) Willy Willy
75. Match List - I with List - II and choose the correct answer from the codes given below :
- | List - I | List - II |
|------------------------------------|--|
| (Analytical Functions) | (Activity under the function) |
| (a) Defining scope of EIA | (i) Critical Assessment of impacts |
| (b) Identification of impacts | (ii) Estimation of the probability that a particular impact will occur |
| (c) Prediction of impacts | (iii) Description of the existing environment system |
| (d) Impact Evaluation and Analysis | (iv) Deciding important issues and concerns |
| (a) (b) (c) (d) | |
| (1) (iii) (iv) (i) (ii) | |
| (2) (iv) (iii) (ii) (i) | |
| (3) (ii) (i) (iii) (iv) | |
| (4) (i) (ii) (iv) (iii) | |

76. In the context of REDD⁺ initiatives the land clearing in forest areas is primarily concerned with :
- (1) Physical resources of the area
 - (2) Ecology of the area
 - (3) Carbon budget of the area
 - (4) Water resources of the area
77. Risk assessment in EIA does not involve :
- (1) Maximum credible analysis
 - (2) Hazard and operability studies
 - (3) Preparation of disaster management plan
 - (4) Assessment of economic benefit arising out of a project
78. ENVIS was established in :
- (1) 1980
 - (2) 1981
 - (3) 1982
 - (4) 1983
79. Soil fulvic acid are strong chelators of :
- (1) Iron (II)
 - (2) Iron (III)
 - (3) Both Iron (II) and Iron (III)
 - (4) Fe (OH)₃
80. Pitchblende is an ore of :
- (1) Nickel
 - (2) Chromium
 - (3) Molybdenum
 - (4) Uranium
81. Shell of egg in bird becomes thin (not properly formed) due to the pollution of pesticides. This is due to interference in the activity of :
- (1) Calmodulin
 - (2) Mg ATPase
 - (3) Ca ATPase
 - (4) None of the above
82. Trichoderma harzianum has proved a useful microorganism for :
- (1) Reclamation of wastelands
 - (2) Bioremediation of contaminated soils
 - (3) Gene transfer in higher plants
 - (4) Biological control of soil borne plant pathogens
83. Which one of the following is a methyl isocyanate (MIC) based pesticide ?
- (1) Sevin (Carbaryl)
 - (2) Temix (Aldicarb)
 - (3) Furadon (Carbofuran)
 - (4) All of the above

84. Which of the following bacterium is called as the superbug that could cleanup oil spill ?
- (1) *Pseudomonas putida*
 - (2) *Pseudomonas denitrificans*
 - (3) *Bacillus subtilis*
 - (4) *Bacillus denitrificans*
85. Tehri Dam of Uttarakhand has been constructed on the river
- (1) Teesta
 - (2) Alaknanda
 - (3) Bhagirathi
 - (4) Ghaggar
86. How many agreements are there in Agenda-21 ?
- (1) 4
 - (2) 5
 - (3) 6
 - (4) 7
87. World water day has been celebrated since ?
- (1) 1987
 - (2) 1997
 - (3) 1977
 - (4) 2007
88. All of the following materials will raise the pH of an acid soil, except :
- (1) Calcium carbonate
 - (2) Magnesium oxide
 - (3) Dolomite
 - (4) Sulphur
89. What is the expected cation exchange capacity (me/100 g) of a soil that with 5% organic matter, 20% montmorillonite clay, and 30% kaolinite ?
- (1) 28
 - (2) 33
 - (3) 38
 - (4) 22
90. What is theme of World Environment Day 2017 ?
- (1) Connecting people to nature
 - (2) Zero Tolerance for the Illegal Wildlife trade
 - (3) Go Green
 - (4) None of the above
91. One carbon credit is equivalent to :
- (1) 10000 Kg of CO₂
 - (2) 1000 Kg of CO₂
 - (3) 100 Kg of CO₂
 - (4) 10 Kg of CO₂

92. "Haryali Yojna" is related to :
- (1) Crop management (2) Soil management
(3) Air management (4) Water management
93. National Renewable Energy Act came in year ?
- (1) 2000 (2) 2005
(3) 2010 (4) 2015
94. Which of the following material has highest hydraulic conductivity ?
- (1) Sandstone (2) Limestone
(3) Clay (4) Quartzite
95. Profuse growth of bacteria in water body results in ?
- (1) Death of algae (2) Death of aquatic plants
(3) Deaths of fishes (4) Lesser nutrients in water
96. Almatti dam is present on which river ?
- (1) Narmada (2) Cauvery
(3) Krishna (4) Godavari
97. What is the name given to the diversion channels of the Western Himalayas ?
- (1) Phalodi (2) Khadins
(3) Guls or Kuls (4) Johad
98. Sheet erosion is caused by :
- (1) Wind (2) Glaciers
(3) Heavy rain (4) Fast running river
99. What is the bond length of hydrogen bond between two water molecules in liquid water ?
- (1) 0.0177 nm (2) 0.177 nm
(3) 1.177 nm (4) 17.70 nm
100. What is the concentration of H^+ ion in a solution of 0.1 M NaOH ?
- (1) 10^{-13} M (2) 9^{-13} M
(3) $10^{-13} M^2$ (4) $9^{-13} M^2$

1. 1	16. 1	31. 3	46. 1	61. 4	76. 3	91. 2
2. 2	17. 2	32. 4	47. 3	62. 1	77. 4	92. 4
3. 3	18. 1	33. 2	48. 1	63. 2	78. 3	93. 4
4. 4	19. 1	34. 1	49. 1	64. 3	79. 1	94. 3
5. 1	20. 3	35. 3	50. 4	65. 4	80. 4	95. 3
6. 3	21. 4	36. 3	51. 2	66. 3	81. 1	96. 3
7. 2	22. 3	37. 4	52. 1	67. 1	82. 2	97. 3
8. 3	23. 1	38. 1	53. 2	68. 1	83. 4	98. 3
9. 1	24. 2	39. 1	54. 2	69. 1	84. 1	99. 2
10. 3	25. 4	40. 2	55. 4	70. 4	85. 3	100. 1
11. 4	26. 1	41. 4	56. 3	71. 2	86. 2	
12. 4	27. 3	42. 2	57. 3	72. 4	87. 2	
13. 1	28. 4	43. 1	58. 3	73. 3	88. 4	
14. 4	29. 4	44. 2	59. 1	74. 1	89. 2	
15. 2	30. 4	45. 1	60. 3	75. 2	90. 1	

1. 4	16. 3	31. 2	46. 3	61. 4	76. 3	91. 1
2. 4	17. 3	32. 1	47. 4	62. 2	77. 1	92. 2
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8. 1	23. 3	38. 3	53. 1	68. 1	83. 3	98. 4
9. 1	24. 1	39. 1	54. 2	69. 1	84. 4	99. 2
10. 3	25. 2	40. 3	55. 4	70. 4	85. 1	100. 1
11. 2	26. 3	41. 3	56. 1	71. 4	86. 3	
12. 4	27. 4	42. 4	57. 3	72. 1	87. 2	
13. 4	28. 3	43. 2	58. 4	73. 2	88. 3	
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4. 2	19. 4	34. 3	49. 1	64. 1	79. 2	94. 2
5. 1	20. 4	35. 3	50. 4	65. 2	80. 1	95. 4
6. 1	21. 1	36. 3	51. 3	66. 3	81. 4	96. 3
7. 3	22. 2	37. 3	52. 4	67. 4	82. 4	97. 3
8. 1	23. 3	38. 3	53. 2	68. 3	83. 1	98. 3
9. 1	24. 4	39. 2	54. 1	69. 1	84. 4	99. 1
10. 4	25. 1	40. 1	55. 3	70. 4	85. 2	100. 3
11. 4	26. 3	41. 4	56. 3	71. 1	86. 1	
12. 3	27. 2	42. 1	57. 4	72. 2	87. 2	
13. 1	28. 3	43. 2	58. 1	73. 4	88. 1	
14. 2	29. 1	44. 3	59. 1	74. 1	89. 1	
15. 4	30. 3	45. 4	60. 2	75. 3	90. 3	

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2. 4	17. 3	32. 4	47. 3	62. 2	77. 3	92. 2
3. 3	18. 3	33. 1	48. 3	63. 4	78. 1	93. 3
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6. 3	21. 3	36. 1	51. 4	66. 2	81. 4	96. 3
7. 4	22. 4	37. 2	52. 1	67. 2	82. 3	97. 2
8. 3	23. 2	38. 1	53. 2	68. 4	83. 1	98. 3
9. 1	24. 1	39. 1	54. 3	69. 2	84. 2	99. 1
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11. 2	26. 3	41. 2	56. 3	71. 4	86. 1	
12. 1	27. 4	42. 4	57. 1	72. 2	87. 3	
13. 2	28. 1	43. 4	58. 1	73. 1	88. 4	
14. 2	29. 1	44. 3	59. 1	74. 2	89. 4	
15. 4	30. 2	45. 3	60. 4	75. 1	90. 4	
